(FILE 'HOME' ENTERED AT 15:34:50 ON 12 JUL 2000)

FILE 'BIOSIS, MEDLINE, CAPLUS, EMBASE, SCISEARCH' ENTERED AT 15:35:51 ON 12 JUL 2000

L1	6	S	JOINT TIME FREQUENCY TRANSFORM
L2	4		DUPLICATE REMOVE L1 (2 DUPLICATES REMOVED)
L3	7155	S	FAST FOURIER TRANSFORM
L4	3305826	S	NUCLEIC ACID? OR OLIGONUCLEOTIDE? OR DNA OR RNA
L5	56	S	L3 AND L4
L6	193452	S	ARRAY?
L7	576687	S	ELECTRODE
L8	0	S	L5 AND L6 AND L7
L9	1	S	L5 AND L6
L10	7127	S	ALTERNATING CURRENT?
L11	2606	S	HARMONIC ANALYSIS
L12	0	S	L4 AND L10 AND L11
L13	87	S	L4 AND L10
L14	21	S	L4 AND L11
L15	0	S	L14 AND L6 AND L7
L16	0	S	L14 AND L7
L17	0	S	L14 AND L6
L18	8		DUPLICATE REMOVE L14 (13 DUPLICATES REMOVED)
L19	0	S	L4 AND L6 AND L7 AND L10
L20	0	S	L4 AND L6 AND L10
L21	38	S	L4 AND L7 AND L10
L22	23		DUPLICATE REMOVE L21 (15 DUPLICATES REMOVED)
L23	93	S	PEAK RECOGNITION
L24	3	S	L4 AND L23
L25	743880	S	PROCESSING
L26	17	S	L23 AND L25
L27	14		DUPLICATE REMOVE L26 (3 DUPLICATES REMOVED)
L28	0	S	L10 AND L23
L29	6249	S	DIGITAL FILTER?
L30	16	S	L4 AND L29
L31	0	S	L7 AND L30
L32	0	S	L10 AND L30
L33	2872	S	SIGNAL AVERAGING
L34	9	S	L10 AND L33
L35	3		DUPLICATE REMOVE L34 (6 DUPLICATES REMOVED)
L36	1	S	L10 AND L29
L37	50754	S	SPECTRAL ANALYSIS
L38	29	S	L10 AND L37
L39	0	S	L4 AND L38
L40	11	S	L7 AND L38

2 ANSWER 1 OF 4 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 1998:310007 SCISEARCH
GA The Genuine Article (R) Number: ZH484
TI **Joint time-frequency transform** for radar range Doppler imaging
AU Chen V C (Reprint); Qian S
CS USN, RES LAB, DIV RADAR, 4555 OVERLOOK AVE SW, WASHINGTON, DC 20375 (Reprint); NATL INSTRUMENTS CORP, DSP GRP, AUSTIN, TX 78730
CYA USA
SO IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, (APR 1998) Vol. 34, No. 2, pp. 486-499.
Publisher: IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, 345 E 47TH ST, NEW YORK, NY 10017-2394.
ISSN: 0018-9251.
DT Article; Journal
FS ENGI
LA English
REC Reference Count: 17
AB Conventional radar imaging uses the Fourier transform to retrieve Doppler information. However, due to the complex motion of a target, the Doppler frequency shifts are actually time-varying. By using the Fourier transform, the Doppler spectrum becomes smeared and the image is blurred. Without resorting to sophisticated motion compensation algorithms, the image blurring problem can be resolved with the **joint time-frequency transform**. High-resolution time-frequency transforms are investigated, and examples of applications to radar imaging of single and multiple targets with complex motion are given.
CC AEROSPACE ENGINEERING & TECHNOLOGY; ENGINEERING, ELECTRICAL & ELECTRONIC
STP KeyWords Plus (R): WIGNER DISTRIBUTION; SIGNAL ANALYSIS; TOOL
RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
AUSHERMAN D A	1984	20	363	IEEE T AERO ELEC SYS
CARRARA W G	1995		CH4	SPOTLIGHT SYNTHETIC
CHEN V C	1994	33	2212	OPT ENG
CHEN V C	1995	2491	373	P SOC PHOTO-OPT INS
CLAASEN T A	1980	35	1067	PHILLIPS J RES
CLAASEN T A C M	1980	35	217	PHILIPS J RES
CLAASEN T A C M	1980	35	276	PHILIPS J RES
COHEN L	1995			TIME FREQUENCY ANAL
DAVENPORT W B	1958			INTRO THEORY RANDOM
JONES D L	1992	40	413	IEEE T SIGNAL PROCES
MALLAT S G	1993	41	3397	IEEE T SIGNAL PROCES
QIAN S	1994	42	2836	IEEE T SIGNAL PROCES
QIAN S	1996		CH3	JOINT TIME FREQUENCY
QIAN S	1994	36	1	SIGNAL PROCESS
RIHACZEK A W	1996		CH6	RADAR RESOLUTION COM
WEHNER D R	1994		CH6	HIGH RESOLUTION RADA
WOODWARD P M	1980		CH7	PROBABILITY INFORMAT

L2 ANSWER 2 OF 4 MEDLINE DUPLICATE 1
AN 92387717 MEDLINE
DN 92387717
TI Time-frequency transforms: a new approach to first heart sound frequency dynamics.
AU Wood J C; Buda A J; Barry D T

CS Department of Internal Medicine, University of Michigan Medical School, Ann Arbor 48109..
NC NS01701 (NINDS)
HL34691 (NHLBI)
SO IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING, (1992 Jul) 39 (7) 730-40. Journal code: GFX. ISSN: 0018-9294.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
EM 199212
AB This study employed a new analytical tool, the Binomial **joint time-frequency transform**, to test the hypothesis that first heart sound frequency rises during the isovolumic contraction period. Cardiac vibrations were recorded from eight open chest dogs using an ultralight accelerometer cemented directly to the epicardium of the anterior left ventricle. The frequency response of the recording system was flat +/- 3 dB from 0.1 to 400 Hz. Three characteristic time-frequency spectral patterns were evident in the animals investigated: 1) A frequency component that rose from approximately 40-140 Hz in a 30-50 ms interval immediately following the ECG R-wave. 2) A slowly varying or static frequency of 60-100 Hz beginning midway through the isovolumic contraction period. 3) Broad-band peaks occurring at the time of the Ia and Ib high frequency components. The presence of rapid frequency dynamics limits the usefulness of stationary analysis techniques for the first heart sound. The Binomial transform provided much better resolution than the spectrograph or spectrogram, the two most common non-stationary signal analysis techniques. By revealing the onset and dynamics of first heart sound frequencies, time-frequency transforms may allow mechanical assessment of individual cardiac structures.
CT Check Tags: Animal; Male; Support, Non-U.S. Gov't; Support, U.S. Gov't, Non-P.H.S.; Support, U.S. Gov't, P.H.S.
Dogs
Evaluation Studies
Fourier Analysis
*Heart Sounds
*Hemodynamics
Phonocardiography: MT, methods
*Phonocardiography: ST, standards
*Signal Processing, Computer-Assisted

L2 ANSWER 3 OF 4 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 92:366761 SCISEARCH
GA The Genuine Article (R) Number: HY634
TI WIGNER DISTRIBUTION DECOMPOSITION AND CROSS-TERMS DELETED REPRESENTATION
AU SHIE Q (Reprint); MORRIS J M
CS NATL INSTRUMENTS, DIV DSP, 6504 BRIDGE POINT PKWY, AUSTIN, TX, 78730 (Reprint)
CYA USA
SO SIGNAL PROCESSING, (MAY 1992) Vol. 27, No. 2, pp. 125-144. ISSN: 0165-1684.
DT Article; Journal
FS ENGI
LA ENGLISH
REC No References
Keyed
AB In this paper, we represent the Wigner Distribution (WD) of an arbitrary signal, via the Gabor expansion, in terms of a linear combination of elementary WDs, which can be easily partitioned into two subsets: auto WDs and cross WDs. The Gabor coefficients, C(m,n) for this

decomposition are obtained with a Gaussian-shaped synthesis function. The optimally concentrated auto WDs are non-negative and entirely free of cross-terms; the sum of these auto WDs we call the cross-terms deleted representation (CDR). The sum of the cross WDs is an oscillating function with non-zero energy in general; it can be removed and returned depending on the user's needs. Such a decomposition illustrates and isolates the mechanism of WD negative values and cross-term interference. Moreover, new information is provided to facilitate the design of valid joint time-frequency signal representations and time-varying filters. Also in this paper, analogous, yet more practical, results are shown for the Discrete Wigner Distribution (DWD) for finite or periodic discrete-time signals. Examples are presented to demonstrate the CDR technique and its performance in comparison with other joint time-frequency distributions. It is shown that the CDR has the high energy concentration of the WD without the interference problems that occur in many other approaches. Moreover. because only the Gabor coefficients, C(m,n), need be computed on-line, the CDR is suitable for on-line implementation.

CC ENGINEERING, ELECTRICAL & ELECTRONIC

ST Author Keywords: WIGNER DISTRIBUTION; GABOR EXPANSION; **JOINT TIME FREQUENCY TRANSFORMS**; CROSS-TERM INTERFERENCE; SPECTROGRAM; CHOI-WILLIAMS DISTRIBUTION; DISCRETE WIGNER DISTRIBUTION

L2 ANSWER 4 OF 4 BIOSIS COPYRIGHT 2000 BIOSIS

AN 1991:39582 BIOSIS

DN BR40:16562

TI NEW EVIDENCE FOR MYOCARDIAL GENESIS OF THE FIRST HEART SOUND.

AU WOOD J C; BARRY D T; GALLAGHER M; HAARER S; BUDA A J

CS UNIV. MICH. MED. SCH., ANN ARBOR, MICH.

SO 63RD SCIENTIFIC SESSIONS OF THE AMERICAN HEART ASSOCIATION, DALLAS, TEXAS, USA, NOVEMBER 12-15, 1990. CIRCULATION. (1990) 82 (4 SUPPL 3), III578. CODEN: CIRCAZ. ISSN: 0009-7322.

DT Conference

FS BR; OLD

LA English

CC General Biology - Symposia, Transactions and Proceedings of Conferences, Congresses, Review Annuals 00520
Cardiovascular System - General; Methods *14501
Cardiovascular System - Physiology and Biochemistry *14504

BC Canidae 85765

IT Miscellaneous Descriptors
ABSTRACT DOG **JOINT TIME FREQUENCY**

9 ANSWER 1 OF 1 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1991:268013 BIOSIS
DN BA92:628
TI **FAST FOURIER TRANSFORM**-BASED CORRELATION OF **DNA** SEQUENCES USING COMPLEX PLANE ENCODING.
AU CHEEVER E A; OVERTON G C; SEARLS D B
CS CENT. ADVANCED INFORMATION TECHNOL., UNISYS CORP., P.O. BOX 517, PAOLI, PA. 19301.
SO COMPUT APPL BIOSCI, (1991) 7 (2), 143-154.
CODEN: COABER. ISSN: 0266-7061.
FS BA; OLD
LA English
AB The detection of similarities between **DNA** sequences can be accomplished using the signal-processing technique of cross-correlation. An early method used the **fast Fourier transform** (FFT) to perform correlations on **DNA** sequences in O(n log n) time for any length sequence. However, this method requires many FFTs (nine), runs no faster if one sequence is much shorter than the other, and measures only global similarity, so that significant short local matches may be missed. We report that, through the use of alternative encodings of the **DNA** sequence in the complex plane, the number of FFTs performed can be traded off against (i) signal-to-noise ratio, and (ii) a certain degree of filtering for local similarity via k-tuple correlation. Also, when comparing probe sequences against much longer targets, the algorithm can be sped up by decomposing the target and performing multiple small FFTs in an overlap-save arrangment. Finally, by decomposing the probe sequence as well, the detection of local similarities can be further enhanced. With current advances in extremely fast hardware implementations of signal-processing operations, this approach may prove more practical than heretofore.
CC General Biology - Information, Documentation, Retrieval and Computer Applications *00530
Mathematical Biology and Statistical Methods *04500
Biochem

L18 ANSWER 1 OF 8 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 1
AN 2000:253260 BIOSIS
DN PREV200000253260
TI **Harmonic analysis** of **DNA** dynamics in a viscous medium.
AU Shih, Chia C. (1); Georghiou, S. (1)
CS (1) Department of Physics, University of Tennessee, Knoxville, TN, 37996-1200 USA
SO Journal of Biomolecular Structure and Dynamics, (April, 2000) Vol. 17, No. 5, pp. 921-932. print..
ISSN: 0739-1102.
DT Article
LA English
SL English
AB The harmonic dynamics of normal modes of double-stranded **DNA** in a viscous fluid are investigated. The model **DNA** consists of two backbone-supported **DNA** strands coiling around a common helix axis with base stacking, sugar puckering, interstrand hydrogen bonding, and intrastrand sugar-base interactions assigned values based on published data. Assuming that the **DNA** bases are shielded from direct bombardment by the solvent, analytical solutions are obtained. The dissipation and fluctuation of the normal modes of the bases moving along the spirals display the effect of the medium indirectly through interactions with the backbone. The dynamics of the backbone are found to be overdamped with the characteristic damping times extending to the picosecond region for disturbance in position and to the sub-picosecond region for disturbance in velocity. In addition to the dynamic mode of a rigid rod, the motions of the bases are coupled to the motions of the backbone with comparable amplitudes for disturbance in position. For disturbance in velocity, however, the bases are effectively at rest, not being able to follow the motions of the backbone. The angular frequencies of the underdamped vibrational modes, identified as the ringing modes of the bases with the backbone effectively at rest, are insensitive to the viscosity and lie in the low frequency region of the Raman spectrum. These findings indicate that the backbone of **DNA** plays a significant role in modulating the dynamics of double-stranded **DNA** in an overdamping environment. This modulation of the dynamics of the motions of the bases in **DNA** by environmental impediments to molecular motion is briefly discussed in connection with protein- and drug-**DNA** interactions as well as gene regulation.
CC Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biophysics - Biocybernetics *10515
IT Major Concepts
Biochemistry and Molecular Biophysics; Models and Simulations (Computational Biology)
IT Chemicals & Biochemicals
double-stranded **DNA**
IT Miscellaneous Descriptors
DNA dynamics: **harmonic analysis**; drug-**DNA** interactions; gene regulation; molecular motion; protein-**DNA** interaction; viscous medium

L18 ANSWER 2 OF 8 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 2
AN 1998:548964 CAPLUS
DN 129:286999

It would have been o[illegible] [illegible]il in the art at the time the invention was made to have synthesize[illegible] [illegible]more sources of mRNA using a primer containing a specific se[illegible] [illegible]T7 promoter sequence as suggested by Logel *et al.* and have pro[illegible] [illegible]A from a cDNA library representing two or more sources of mR[illegible] [illegible]labeled primer as suggested by Luehrsen *et al.* and T7 polyme[illegible] [illegible]*et al.*. The prior arts provided by Sagerstrom *et al.*, Loge *et al* [illegible] [illegible]otivated one having ordinary skill in the art to test the pos[illegible] [illegible]NAs from two or more sources of mRNA using a primer contain[illegible] [illegible]ted from T3 or T7 promoter sequence and produce differe[illegible] [illegible]ibrary representing two or more sources of mRNA in the pre[illegible] [illegible]as suggested by Luehrsen *et al.* and T7 polymerase. One hav[illegible] [illegible]the invention was made would have been a reasonable expect[illegible] [illegible]methods together because all of these methods are known in [illegible]

11. No claim is allowed.

12. Papers related to thi[illegible] [illegible]00 by facsimile transmission. Papers should [illegible] [illegible]. Center located in Crystal Mall 1. The faxing of such pa[illegible] [illegible]ished in the Official

Gazette, 1096 OG 30 (Noven ... 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 ... number is either (703) 308-4242 or (703)305-3014.

Any inquiry concerni ... ications from the examiner should be directed to Frank L ... 3) 305-1270. The examiner can normally be re ... 5 P.M.

If attempts to reach t ... the examiner's supervisor, W. Gary Jones, can be reach ...

Any inquiry of a gene ... application should be directed to the Chemical Ma ... is (703) 308-0196.

Frank Lu
July 12, 2000

TI Continuum Solvent Studies of the Stability of **DNA**, **RNA**, and Phosphoramidate-**DNA** Helixes

AU Srinivasan, Jayash[illegible]; Cheatham, Thomas E., III; Cie[illegible]iak, Piotr; Kollman, Peter A.; Case, David A.

CS Department of Molecular Biology, Scripps Research Institute, La Jolla, CA, 92037, USA

SO J. Am. Chem. Soc. (1998), 120(37), 9401-9409
CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

DT Journal

LA English

CC 6-2 (General Biochemistry)

AB We apply continuum solvent models to investigate the relative stability of A- and B-form helixes for three **DNA** sequences, d(CCAACGTTGG)2, d(ACCCGCGGGT)2, and d(CGCGAATTCGCG)2, a phosphoramidate-modified **DNA** duplex, p(CGCGAATTCGCG)2, in which the O3' atom in deoxyribose is replaced with NH, and an **RNA** duplex, r(CCAACGUUGG)2. Structures were taken as snapshots from multi-nanosecond mol. dynamics simulations computed in a consistent fashion using explicit solvent and with long-range electrostatics accounted for using the particle-mesh Ewald procedure. The electrostatic contribution to solvation energies were computed using both a finite-difference Poisson-Boltzmann (PB) model and a pairwise generalized Born model; nonelectrostatic contributions were estd. with a surface-area-dependent term. To these solvation free energies were added the mean solute internal energies (detd. from a mol. mechanics potential) and ests. of the solute entropy (from a **harmonic anal.**). Consistent with expt., the relative energies favor B-form helixes for **DNA** and A-form helixes for the NP-modified system and for **RNA**. Salt effects, modeled at the linear or nonlinear PB level, favor the A-form helixes by modest amts.; for d(ACCCGCGGGT)2, salt is nearly able to switch the conformational preference to "A". The results provide a phys. interpretation for the origins of the relative stabilities of A- and B-helixes and suggest that similar analyses might be useful in a variety of **nucleic acid** conformational problems.

ST **DNA RNA** helix conformation stability

IT Helix (**DNA** conformation)
(continuum solvent studies of the stability of **DNA**, **RNA**, and phosphoramidate-**DNA** helixes)

IT **DNA**
RNA
RL: PRP (Properties)
(continuum solvent studies of the stability of **DNA**, **RNA**, and phosphoramidate-**DNA** helixes)

IT 147178-97-0 154948-04-6 166802-52-4 190210-89-0 214071-69-9
RL: PRP (Properties)
(continuum solvent studies of the stability of **DNA**, **RNA**, and phosphoramidate-**DNA** helixes)

L18 ANSWER 3 OF 8 SCISEARCH COPYRIGHT 2000 ISI (R)

AN 1998:323687 SCISEARCH

GA The Genuine Article (R) Number: ZJ230

TI Microfibrillar buckling within fibers under compression

AU Odijk T (Reprint)

CS DELFT UNIV TECHNOL, FAC CHEM ENGN & MAT SCI, POB 5045, NL-2600 GA DELFT, NETHERLANDS (Reprint)

CYA NETHERLANDS

SO JOURNAL OF CHEMICAL PHYSICS, (22 APR 1998) Vol. 108, No. 16, pp.

10. Claims 17 is rejecte unpatentable over Sagerstrom *et al.*, (Annu. Rev. Bi hem. 6(el *et al.*, (Biotechnique 13, 604-610), Luehrsen *et a.*, (Biote 7), and Bodescot *et al.*, (DNA Cell Biology 13, 977-98 , 1994)

The teachin of Sag

Sagerstrom *et al.* do n ized previously, *supra.*

(tracer) from tissue A with fter subtracting 1st strand cDNA

T3 or T7 promoter equenc er), a tag sequence selected from

primer and T7 poly erase. esence of fluorescence labeled

The teachings of Lo

Logel *et al.* lo not reviously, *supra.*

poly(A)+ RNA fro tissue B d cDNA (tracer) from tissue A with

presence of fluorescence labe ary and synthesis of cDNA in the

The teachings of L

Luehrsen *et al.* do n d previously, *supra.*

with poly(A)+ RN.A from ti d cDNA (tracer) from tissue A

polymerase. DNA in the presence of T7

Bodescot *et al.*, tea

(page 977, abstract). is using T7 DNA polymerase

6923-6928.
Publisher: AMER INST PHYSICS, CIRCULATION FULFILLMENT DIV, 500 SUNNYSIDE BLVD, WOODBURY, NY, 11797-2999.
ISSN: 0021-9606.
DT Article; Journal
FS PHYS
LA English
REC Reference Count: 22
AB A tentative theory is presented of microfibrillar buckling within compressed fibers. A quantitative **harmonic analysis** is given of the semiclassical buckling of a clamped stiff chain; the influence of thermal undulations is incorporated in Euler buckling. A scaling analysis including entropy allows one to understand semiclassical buckling. The buckling of a microfibril within a fibrous environment is analyzed in two limits: (a) when the fiber is incompressible; (b) when the matrix is assumed to be a fixed harmonic potential. In the latter case, a network of microfibrils may melt at high enough compression before the usual bucking occurs. We also study the renormalization of the confining potential by long-range elastic fields. A provisional comparison with experimental studies on macroscopic failure is given. (C) 1998 American Institute of Physics.
CC PHYSICS, ATOMIC, MOLECULAR & CHEMICAL
STP KeyWords Plus (R): WORMLIKE CHAINS; POLYMERS; COMPOSITES; FILAMENTS; STRENGTH; MODEL; **DNA**

RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
BRODLAND G W	1990	112	319	J BIOMECH ENG-T ASME
COHEN Y	1988	21	433	MACROMOLECULES
DEGENNES P G	1982			POLYM LIQUID CRYSTAL
GREEN D I	1990	31	579	POLYMER
GREENWOOD J H	1974	9	1809	J MATER SCI
INGBER D E	1993	104	613	J CELL SCI
JAIN S	1995	29	8523	MACROMOLECULES
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JELF P M	1992	26	2706	J COMPOS MATER
KASSAPIDOU K				IN PRESS EUR J PHYS
KROY K	1996	77	306	PHYS REV LETT
LANDAU L D	1986			THEORY ELASTICITY
ODIJK T	1993	24	177	EUROPHYS LETT
ODIJK T	1996	105	1270	J CHEM PHYS
ODIJK T	1983	16	1340	MACROMOLECULES
ODIJK T	1986	19	2313	MACROMOLECULES
ODIJK T	1995	28	7016	MACROMOLECULES
SAWYER L C	1993	28	225	J MATER SCI
SHIMADA J	1984	17	689	MACROMOLECULES
SWANSON S R	1992	114	8	J ENG MATER-T ASME
WEGNER G	1996	101	257	MACROMOL SYMP
YAMAKAWA H	1971			MODERN THEORY POLYM

DUPLICATE 3

L18 ANSWER 4 OF 8 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1999:172759 BIOSIS
DN PREV199900172759
TI Continuum solvent studies of the stability of **RNA** hairpin loops and helices.
AU Srinivasan, Jayashree; Miller, Jennifer; Kollman, Peter A.; Case, David A.
CS (1) (1) Dep. Molecular Biol., Scripps Res. Inst., La Jolla, CA 92037 USA
SO Journal of Biomolecular Structure and Dynamics, (Dec., 1998) Vol. 16, No. 3, pp. 671-682.
ISSN: 0739-1102.
DT Article

Stratagene Catalogue ([illegible]ge 298) te[illegible]escript II SK (+/-) phagemid vector comprising an origin of replicat[illegible]lected mar[illegible]e. T7 and T3 promoter sequences.

It would have been o[illegible]ne having [illegible]kill in the art at the time the invention was made to have synthesized [illegible]d cDNAs [illegible]or more sources of mRNA using a hemi-tailed vector or primer [illegible]an origin[illegible]ication, a selected marker gene, a T7 or T3 promoter sequence and a[illegible]unique res[illegible]donuclease site distal to the tailed terminus of the plasmid as su[illegible]v Maro[illegible]atagene Catalogue, and have produced a single cDNA libra[illegible]ntime tw[illegible]e sources of mRNA by combining 1st strand cDNAs toge[illegible]her as su[illegible]Belyavsk[illegible]A commercially available pBluescript II SK (+/-) phagemid vector an[illegible]arts p[illegible]erstrom *et al.* and Belyavsky *et al.* would have motivated one ha[illegible]to test the possibility to synthesize 1st strand cDNAs from two or [illegible]of mRN[illegible]a hemi-tailed vector or primer comprising an origin of repli[illegible]lected [illegible]a T7 or T3 promoter sequence and at least one unique re[illegible]striction e[illegible]ed terminus of the plasmid and combine 1st strand cDNAs f[illegible]ml NA together in order to produce a single cDNA libra[illegible]repres[illegible]re[illegible]NA. One having ordinary skill in the art at the time the i[illegible]vention w[illegible]would[illegible]sonable expectation of success to combine these meth[illegible]ds toge[illegible]he[illegible]s are known in the art and are easy to use.

LA English
AB We apply continuum solvent models to investigate the relative stability of various conformational forms for two **RNA** sequences, GGAC(UUCG)GUCC and GGUG(UGAA)CACC. In the first part, we compare alternate hairpin conformations to explore the reliability of these models to discriminate between different local conformations. A second part looks at the hairpin-duplex conversion for the UUCG sequence, identifying major contributors to the thermodynamics of a much large scale transition. Structures were taken as snapshots from multi-nanosecond molecular dynamics simulations computed in a consistent fashion using explicit solvent and with long-range electrostatics accounted for using the Particle-Mesh Ewald procedure. The electrostatic contribution to solvation energies were computed using both a finite-difference Poisson-Boltzmann (PB) model and a pairwise Generalized Born model; non-electrostatic contributions were estimated with a surface-area dependent term. To these solvation free energies were added the mean solute internal energies (determined from a molecular mechanics potential) and estimates of the solute entropy (from a **harmonic analysis**). Consistent with experiment and with earlier solvated molecular dynamics simulations, the UUCG hairpin was found to prefer conformers close to a recent NMR structure determination in preference to those from an earlier NMR study. Similarly, results for the UGAA hairpin favored an NMR-derived structure over that to be expected for a generic GNRA hairpin loop. Experimental free energies are not known for the hairpin/duplex conversion, but must be close to zero since hairpins are seen in solution and duplexes in crystals; out calculations find a value near zero and illustrate the expected interplay of solvation, salt effects and entropy in affecting this equilibrium.
CC Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Genetics and Cytogenetics - General *03502
Comparative Biochemistry, General *10010
Biochemical Methods - Nucleic Acids, Purines and Pyrimidines *10052
Biochemical Studies - General *10060
Biophysics - General Biophysical Studies *10502
Biophysics - Molecular Properties and Macromolecules *10506
IT Major Concepts
Biochemistry and Molecular Biophysics
IT Chemicals & Biochemicals
solvents; **RNA**: hairpin loops, helices, molecular characteristics, stabilities
IT Methods & Equipment
NMR spectroscopy: analytical method, spectroscopic techniques: CB
IT Miscellaneous Descriptors
continuum solvent studies; electrostatics; free energy; thermodynamics

L18 ANSWER 5 OF 8 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 94:649709 SCISEARCH
GA The Genuine Article (R) Number: PK386
TI EMERGENCE OF REGULAR SUPERSTRUCTURES IN MACROMOLECULES
AU BOTTI S A (Reprint); DESANTIS P; FUA M
CS UNIV ROMA LA SAPIENZA, DIPARTIMENTO CHIM, I-00185 ROME, ITALY (Reprint)
CYA ITALY
SO BERICHTE DER BUNSEN GESELLSCHAFT FUR PHYSIKALISCHE CHEMIE-AN INTERNATIONAL JOURNAL OF PHYSICAL CHEMISTRY, (SEP 1994) Vol. 98, No. 9, pp. 1194-1197. ISSN: 0005-9021.
DT Article; Journal
FS PHYS
LA ENGLISH
REC Reference Count: 8

9. Claims 13 is rejected under 35 U.S.C. 103(eing unpatentable over Sagerstrom *et al.*, (Annu. Rev. Biochem. 66, 751-783, 1997) in vi Belyavsky *et al.*, (US Patent 5,814, 445, filed on July 11, 1995), Margolskee (US Patent 5,2 filed on August 12, 1992), and Stratagene Catalogue (1994, page 298).

The teachings of Sager rom *et al.* have be marized previously, *supra.*

Sagerstrom *et al.* do not disclose cDNA co ion after subtracting 1st strand cDNA (tracer) from tissue A with poly(A)+ RNA from ti (liver) and a hemi-tailed vector or primer comprising an origin of replication, a selecte ker gene, a T7 or T3 promoter sequence and at least one unique restriction endonuclease sit to the tailed terminus of the plasmid.

The teachings of Belyavsky *et al.* have bee marized previously, *supra.*

Belyavsky *et al.* do not disclose the subtrac 1st strand cDNA (tracer) from tissue A with poly(A)+ RNA from tissue B (liver) and a h le I vector or primer comprising an origin of replication, a selected marker gene, a T7 promoter sequence and at least one unique restriction endonuclease site distal to the ta minus of the plasmid.

Margolskee teach hig y cloning e ing a hemi-tailed vector or primer (see Figure 1).

Margolskee does not disclose cDNA cons ly subtracting 1st strand cDNA (tracer) from tissue A with poly(A)+ RNA from t (liver) and a hemi-tailed vector or primer comprising a T7 or T3 promoter sequence

AB A general method is described in which the **harmonic analysis** of perturbations is applied to the study of superstructures of macromolecular chains. The theoretical approach employed has been to apply harmonic perturbations on the conformational parameters in macromolecular helices of various periodicities and to study the overall variation in structure and its dependency on the periodicity of the perturbation. The results clearly show that when these perturbations do not contain harmonics close to the fundamental periodicities of the polymer chain, the consequent structural effects remain localized and are not productive at a superstructural level. Furthermore, the features of these superstructures are dependent only on the amplitude of the fundamental periodicity component of the perturbation and are generated by topologically equivalent transformations. These findings enable us to devise a model to study and identify transconformational pathways leading to global variations in the structure of the macromolecular chain.

CC CHEMISTRY, PHYSICAL

ST Author Keywords: BIOLOGICAL MACROMOLECULES; COMPUTER EXPERIMENTS; POLYMER

STP KeyWords Plus (R): THEORETICAL PREDICTION; CURVATURE; SEQUENCE; PROTEINS; **DNAS**

RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
AMADEI A	1993	17	412	PROTEINS
BOFFELLI D	1991	39	127	BIOPHYS CHEM
BOFFELLI D	1992	42	1409	INT J QUANTUM CHEM
DESANTIS P	1993	46	193	BIOPHYS CHEM
DESANTIS P	1984	23	1547	BIOPOLYMERS
DESANTIS P	1985			STRUCTURE MOTION MEM
MOROSETTI S	1974	7	52	MACROMOLECULES
TRIFONOV E N	1980	77	3816	P NATL ACAD SCI USA

L18 ANSWER 6 OF 8 SCISEARCH COPYRIGHT 2000 ISI (R)

AN 94:15691 SCISEARCH

GA The Genuine Article (R) Number: MM819

TI SPECTRAL-ANALYSIS FOR CATEGORICAL TIME-SERIES - SCALING AND THE SPECTRAL ENVELOPE

AU STOFFER D S (Reprint); TYLER D E; MCDOUGALL A J

CS UNIV PITTSBURGH, DEPT MATH & STAT, PITTSBURGH, PA, 15260 (Reprint); RUTGERS UNIV, DEPT STAT, NEW BRUNSWICK, NJ, 08903

CYA USA

SO BIOMETRIKA, (SEP 1993) Vol. 80, No. 3, pp. 611-622.
ISSN: 0006-3444.

DT Article; Journal

FS PHYS; LIFE; AGRI

LA ENGLISH

REC Reference Count: 22

AB Many studies produce categorical time series in which **harmonic analysis** is of interest. Although there exist time domain approaches for the analysis of categorical time series such as Markov chains or link function based regression models, there is apparently little statistical theory or methodology for analyzing qualitative-valued time series in the frequency domain. The purpose of this paper is to initiate the development of a general framework for the frequency domain analysis of categorical time series. In doing so, we discuss the scaling of categorical time series and introduce a new concept that we call the spectral envelope of a categorical time series. We demonstrate our methodology on a data set from a problem in molecular biology.

CC MATHEMATICAL METHODS, BIOLOGY & MEDICINE; STATISTICS & PROBABILITY

ST Author Keywords: ASYMPTOTIC DISTRIBUTION OF LATENT ROOTS AND VECTORS; **DNA** SEQUENCING; FREQUENCY DOMAIN ANALYSIS; MARKOV CHAIN;

Logel *et al.* do not disclose the subtraction of 1st strand cDNA (tracer) from tissue A with poly(A)+ RNA from tissue B (driver) and production of cDNA library.

Luehrsen *et al.*, teach analysis of differential expression by RT-PCR products using fluorescent primers and genescan™ software(page 168, abstract) and strand cDNA was synthesized in the presence of fluorescence labeled poly(dT) (page 170, 1st column, last paragraph).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have synthesized 1st strand cDNAs from one or more sources of mRNA using a hemi-tailed primer containing a specific sequence tag selected from T3, T7, and SP6 promoter sequence as suggested by Logel *et al.* and have produced a single cDNA library representing two or more sources of mRNA by combining 1st strand cDNAs together as suggested by Belyavsky *et al.* and synthesizing 2nd strand cDNA in the presence of fluorescence labeled homopolymeric dG oligonucleotide tail to the 3' termini of the heteroduplex molecules as suggested by Luehrsen *et al.*. The prior arts provided by Sagerstrom *et al.* Belyavsky *et al.* would have motivated one having ordinary skill in the art to test the possibility to synthesize 1st strand cDNAs from two or more sources of mRNA using a hemi-tailed primer containing a specific sequence tag selected from T3, T7, and SP6 promoter sequence and combining 1st strand cDNAs from two or more sources of mRNA together in order to produce a single cDNA library representing two or more sources of mRNA. One having ordinary skill in the art at the time the invention was made would have been a reasonable expectation of success to combine these methods together because all of these methods are known in the art and are easy to use

MULTINOMIAL TIME SERIES; SCALING; SPECTRAL ENVELOPE

RF 92-1098 001; BLIND ADAPTIVE EQUALIZERS; SIGNALS IN UNKNOWN CORRELATED NOISE; MAXIMUM-LIKELIHOOD LOCALIZATION; ROBUST ALGORITHM; SENSOR ARRAY DATA; DIRECTION FINDING
92-1840 001; SADDLEPOINT APPROXIMATIONS; ASYMPTOTIC PROPERTIES OF A CONDITIONAL MAXIMUM-LIKELIHOOD ESTIMATOR; EXACT DISTRIBUTION; CANONICAL EXPONENTIAL-FAMILIES

RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
ALOSH M A	1987	8	261	J TIME SER ANAL
ANDERSON T W	1963	34	122	ANN MATH STAT
BILLINGSLEY P	1961			STATISTICAL INFERENC
BRILLINGER D R	1981			TIME SERIES DATA ANA
EATON M L	1991	9	260	ANN STAT
FAHRMEIR L	1987	8	147	J TIME SER ANAL
HANNAN E J	1970			MULTIPLE TIME SERIES
HECKMAN J J	1981		114	STRUCTURAL ANAL DISC
IZENMAN A J	1975	5	248	J MULTIVARIATE ANAL
JOHN S	1963	25	363	SANKHYA A
KARLIN S	1991	86	27	J AM STAT ASSOC
LAI C D	1978	7	65	STOCH P APPL
LEWIS P A W	1980	5	151	MULTIVARIATE ANAL
MAGNUS J R	1979	7	381	ANN STAT
MUIRHEAD R J	1982			ASPECTS MULTIVARIATE
RAFTERY A E	1985	47	528	J ROY STAT SOC B MET
ROSENBLATT M	1959		246	PROBABILITY STATISTI
STOFFER D S	1991	86	461	J AM STAT ASSOC
STOFFER D S	1987	8	49	J TIME SER ANAL
TAVARE S	1989		117	MATH METHODS DNA SEQ
TYLER D E	1981	9	725	ANN STAT
WHISENANT E C	1991	33	133	J MOL EVOL

L18 ANSWER 7 OF 8 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 4
AN 1984:336303 BIOSIS
DN BA78:72783
TI DYNAMICS OF **DNA** OLIGOMERS.
AU TIDOR B; IRIKURA K K; BROOKS B R; KARPLUS M
CS DEP. CHEM., HARVARD UNIV., CAMBRIDGE, MASS. 02138.
SO J BIOMOL STRUCT DYN, (1983 (RECD 1984)) 1 (1), 231-252.
CODEN: JBSDD6. ISSN: 0739-1102.
FS BA; OLD
LA English
AB The techniques of molecular and harmonic dynamics are used to study the internal mobility of 3 double-stranded **DNA** hexamers. A 60 ps molecular dynamics simulation and a normal mode description of d(CpGpCpGpCpG)2 in the B conformation charcacterize the atomic fluctuations of this structure. A comparison between the 2 approaches validates the harmonic results at room temperature. Detailed examination of the normal modes indicates that only the low-frequency modes are needed to detemrine atomic fluctuations. A **harmonic analysis** is made of d(CpGpCpGpCpG)2 in the Z conformation and of d(TpApTpApTpA)2 in the B conformation using only the low-frequency modes. The atomic fluctuations of the 3 alternating pyrimidine-purine helices are compared and the dependence on conformation and sequence are discussed. The insights which theoretical calculations can provide for the interpretation of experimental results are explored.
CC Biochemical Methods - Nucleic Acids, Purines and Pyrimidines 10052
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biophysics - Molecular Properties and Macromolecules *10506
External Effects - Temperature as a Primary Variable 10614

The teachings of Sagerstrom *et al.* have been summarized previously, *supra.*

Sagerstrom *et al.* do not disclose cDNA construction after subtracting 1st strand cDNA (tracer) from tissue A with poly(A)+ RNA from tissue B (driver) and tag sequence.

Belyavsky *et al.* teach a method of identification and cloning differentially expressed mRNA. Figure 1 shows one version of implementing the invention by means of the formation of a set of 3' end labeled fragments of cDNA, dividing it into subsets of fragments with the aid of immobilization on a solid support and sequential treatment with a series of restriction nucleases, and separation of the resulting subsets by electrophoresis (column 4). Note that 1st strand cDNA was synthesized by a hemi-tailed $(T)_{13}$-bio primer and 2nd strand cDNA was synthesized by a homopolymeric dG oligonucleotide tail to the 3' termini of the heteroduplex molecules. In example, synthesis of the second chain of cDNA is done in a reaction mixture containing hybrid mRNA-cDNA, 10 pmol (C)-primer (sequence 5'-AAGGAATT$(C)_{13}$), dATP, dGTP, dCTP, dTTP (0.1 mM each) and 1.5 U DNA polymerase Bio-Taq (Biomaster, Russia).The adaptor is added and ligated. Reamplification of the cDNA fragments with the aid of PCR is done using Bio-(T_{13}) primer and a sequence specific primer (column 8). The specific sequence "AAGGAATT" of $(C)_{13}$ primer can be cut by several different restriction enzymes.

Belyavsky *et al.* do not disclose the subtraction of 1st strand cDNA (tracer) from tissue A with poly(A)+ RNA from tissue B (driver) and tag sequence selected from T3, T7, and SP6 promoter sequence.

The teachings of Logel *et al.* have been summarized previously, *supra.*

Movement 12100
Temperature: Its Measurement, Effects and Regulation - General Measurement
and Methods 23001
IT Miscellaneous Descriptors
INTERNAL MOBILITY

L18 ANSWER 8 OF 8 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 5
AN 1983:160235 BIOSIS
DN BA75:10235
TI PERIODICITIES OF DI NUCLEOTIDE SELF INFORMATION VALUES IN PHAGE PHI-X-174 **DNA**.
AU FURLONG N B; BECKNER C F
CS DEP. TUMOR BIOCHEM., UNIV. TEX. SYSTEM CANCER CENT. TUMOR INST., M.D. ANDERSON HOSP., 6723 BERTNER AVE., HOUSTON, TEX., USA.
SO Z NATURFORSCH SECT C BIOSCI, (1982) 37 (3-4), 321-325.
CODEN: ZNCBDA. ISSN: 0341-0382.
FS BA; OLD
LA English
AB The natural **DNA** sequence of bacteriophage .vphi.X174, when analyzed as a text of dinucleotides, is shown to display an easily detectable degree of non-randomness by the distribution of values of dinucleotide self-information along the sequence. Self-information corresponding to occurrences of dinucleotides separated by a single nucleotide is somewhat higher than the values which preceed or follow it for every third nucleotide position along the sequence. Autocorrelation coefficients of these values display a strong periodicity and **harmonic analysis** of the values shows a spike at a value of 3. Self-information autocorrelation periodicity is used as a test of the effect of randomizing portions of the sequence. Any 1 or 2 of the 3 nucleotides in each triplet of the sequence can be chosen at random without losing dinucleotide self-information periodicity except when both the 1st and 3rd nucleotide of all of the triplets in the major .vphi.X174 protein reading frame are randomized. Periodicity is also lost when sequences are generated by randomizing triplets. Autocorrelation and **harmonic analysis** also indicate other less marked periodic features of dinucleotide self-information values of the native sequence; non-random features are suggested at periods of 12, 20 and 24 nucleotides.
CC Biochemical Methods - Nucleic Acids, Purines and Pyrimidines 10052
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Replication, Transcription, Translation 10300
Biophysics - Molecular Properties and Macromolecules *10506
Metabolism - Proteins, Peptides and Amino Acids 13012
Metabolism - Nucleic Acids, Purines and Pyrimidines 13014
Genetics of Bacteria and Viruses *31500
Virology - Bacteriophage *33504
BC Microviridae 02135
IT Miscellaneous Descriptors
AUTO CORRELATION PERIODICITY TRIPLET PROTEIN READING FRAME

acidic fibroblast growth factor gene, were synthesized with 5' extensions containing promoter sequences for the T7, T3 and SP6 RNA polymerase promoters. A common antisense primer was used with each of the promoter/aFGF primers to prepare PCR-generated DNA fragments (page 604, abstract). Table 1 showed primers containing T3, T7, and SP6 sequences (page 605). Note that T3, T7, and SP6 polymerase were used in this paper (page 609, left column, last paragraph).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have synthesized 1st strand cDNAs from two or more sources of mRNA using the primers containing either T3 or T7 sequences as suggested by Logel *et al.* and have produced a single cDNA library representing two or more sources of mRNA by combining 1st strand cDNAs together as suggested by Takahash *et al.*. The prior arts provided by Sagerstrom *et al.* and Takahash *et al.* would have motivated one having ordinary skill in the art to test the possibility to combine 1st strand cDNAs from two or more sources of mRNA together in order to produce a single cDNA library representing two or more sources of mRNA. One having ordinary skill in the art at the time the invention was made would have been a reasonable expectation of success to combine these methods together because all of these methods are known in the art and are easy to use.

8. Claims 6-12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sagerstrom *et al.*, (Annu. Rev. Biochem. 66, 751-783, 1997) in view of Belyavsky *et al.*, (US Patent 5,814, 445, filed on July 11, 1995), Logel *et al.*, (Biotechnique 13, 604-610), and Luehrsen *et al.*, (Biotechnique 22, 168-174, January 1997).

L22 ANSWER 1 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS
AN 2000:2165 BIOSIS
DN PREV200000002165
TI Cleavage of supercoiled **DNA** by deoxyribonuclease I in solution and at the **electrode** surface.
AU Fojta, Miroslav (1); Kubicarova, Tatiana; Palecek, Emil
CS (1) Institute of Biophysics of the Academy of Sciences of the Czech Republic, Kralovopolska 135, CZ-612 65, Brno Czech Republic
SO Electroanalysis, (Oct., 1999) Vol. 11, No. 14, pp. 1005-1012. ISSN: 1040-0397.
DT Article
LA English
SL English
AB Cleavage of supercoiled **DNA** by deoxyribonuclease I (DNase I) in solution and at the surface of the mercury **electrode** was studied by means of AC voltammetry. This technique produces peak 3 which is produced only by **DNAs** containing free ends (such as linear double-stranded and single-stranded **DNAs** and open circular **DNAs**) but not by covalently closed circular (ccc) **DNAs**. Formation of a single interruption of the sugar-phosphate backbone in the ccc supercoiled (sc) **DNA** results in formation of peak 3. Peak 1 is produced by both ccc **DNA** molecules as well as by **DNAs** containing free ends; changes in height of this peak occur due to **DNA** cleavage. We show that the kinetics of the cleavage of **DNA** in solution and at the **electrode** surface substantially differ suggesting restricted accessibility of the surface-confined **DNA** for the interaction with the enzyme. Cleavage of the immobilized **DNA** is remarkably influenced by the potential of the **electrode** surface. At positively charged surface the enzymati c reaction is inhibited in its initial stage while moderately negative charges stimulate the cleavage of the immobilized **DNA** by DNase I.,
CC Genetics and Cytogenetics - General *03502
Biochemical Methods - General *10050
Biochemical Studies - General *10060
Biophysics - General Biophysical Studies *10502
IT Major Concepts
Molecular Genetics (Biochemistry and Molecular Biophysics); Methods and Techniques
IT Chemicals & Biochemicals
deoxyribonuclease I [DNase I]: Sigma, enzyme, kinetics; supercoiled **DNA**: analysis, solution
IT Methods & Equipment
AC voltammetry [**alternating current** voltammetry]: Analysis/Characterization Techniques: CB, analytical method; EG&G PAR 174A Polarographic Analyzer: equipment; agarose gel electrophoresis: gel electrophoresis, separation method; enzymatic cleavage reaction: Synthesis/Modification Techniques, chemical method; ethidium bromide staining: staining method, staining/visualization; mercury **electrode**: equipment, surface charge
RN 9003-98-9 (DEOXYRIBONUCLEASE I)
9003-98-9 (DNASE I)

L22 ANSWER 2 OF 23 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 1999:77356 SCISEARCH
GA The Genuine Article (R) Number: 157GZ
TI Potential-dependent adsorption/desorption of organic adsorbate at HOPG **electrode** and accompanying delamination of graphite surface

7. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sagerstrom *et al.*, (Annu. Rev. Biochem. 66, 751-783, 1997) in view of Takahash *et al.*, (Genomics 23, 202-210, 1994) and Logel *et al.*, (Biotechnique 13, 604-610).

Sagerstrom *et al.* review progress of subtractive cloning. Note that they compared the methods of subtractive enrichment and positive selection as shown in Figure 7 (page 772). In Figure 7A, 1st strand cDNA (tracer) from tissue A was used to hybridize with poly(A)+ RNA from tissue B (driver). After twice subtraction to remove hybrids, the remaining fraction can be used to clone insert or synthesize probe (page 772).

Sagerstrom *et al.* do not disclose cDNA construction after subtracting strand cDNA (tracer) from tissue A with poly(A)+ RNA from tissue B (driver) and tag sequences.

Takahash *et al.* teach the construction of an equalized cDNA library from mouse embryos. In this study, RNA from ten different stages of mouse ontogenesis were isolated (page 203, left column, third paragraph) and used for cDNA synthesis. Synthesized ds-cDNAs from ten different stages of mouse ontogenesis were mixed and form "S (straight)-cDNA mixture" (page 203, right column, first paragraph).

Takahash *et al.* do not disclose the subtraction of strand cDNA (tracer) from tissue A with poly(A)+ RNA from tissue B (driver) and tag sequences

Logel *et al.* teach synthesis of cRNA probes from PCR-generated DNA. In this study, they compared RNA polymerase promoter activities in PCR-generated DNA fragments for use in the in vitro transcription of cRNA probes. Sense oligonucleotide primers, specific for the mouse

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: combining the products of step a) and b) from claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CAR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

AU He Y F (Reprint); Wang Y; Zhu G Y; Wang E
CS CHINESE ACAD SCI, CHANGCHUN INST APPL CHEM, ELECTROANALYT CHEM LAB, CHANGCHUN 130022, PEOPLES R CHINA (Reprint); CHINESE ACAD SCI, CHANGCHUN INST APPL CHEM, NATL RES & ANALYT CTR ELECTROCHEM & SPECT, CHANGCHUN 130022, PEOPLES R CHINA
CYA PEOPLES R CHINA
SO JOURNAL OF THE ELECTROCHEMICAL SOCIETY, (JAN 1999) Vol. 146, No. 1, pp. 250-255.
Publisher: ELECTROCHEMICAL SOC INC, 10 SOUTH MAIN STREET, PENNINGTON, NJ 08534.
ISSN: 0013-4651.
DT Article; Journal
FS PHYS; ENGI
LA English
REC Reference Count: 34
AB In situ electrochemical scanning tunneling microscopy, **alternating current** voltammetry, and electrochemical quartz crystal microbalance have been employed to follow the potential-dependent adsorption/desorption processes of **nucleic acid** bases on highly oriented pyrolytic graphite (HOPG) **electrode**. The results show that (i) potential-dependent adsorption/desorption of **nucleic acid** bases on HOPG **electrode** was accompanied by delamination of the HOPG surface, and the delamination initiates from steps or kinks on the **electrode** surface, which provide highly active sites for adsorption; (ii) the delamination usually occurred when the **electrode** potential was changed or when the **electrode** was at potentials where the phase transition of adsorbate occurred. These results suggest that the surface stress resulting from the interaction between the substrate and adsorbate, as well as the interaction due to potential-induced surface charge distribution and the hysteresis of charge equilibrium are the main factors resulting in HOPG delamination.
CC ELECTROCHEMISTRY; MATERIALS SCIENCE, COATINGS & FILMS
STP KeyWords Plus (R): SCANNING-TUNNELING-MICROSCOPY; DIFFERENTIAL CAPACITANCE; PYROLYTIC-GRAPHITE; MONOLAYER GUANINE; AQUEOUS-SOLUTIONS; NACL SOLUTION; STRESS; STM; RECONSTRUCTION; INTERFACE

RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
BOCKRIS J O	1970			MODERN ELECTROCHEMIS
CUNHA F	1996	12	6410	LANGMUIR
DRYHURST G	1968	115	1014	J ELECTROCHEM SOC
DRYHURST G	1970	117	1259	J ELECTROCHEM SOC
DRYHURST G	1969	16	855	TALANTA
FARAGGI M	1996	100	14751	J PHYS CHEM-US
FREUND J E	1997	55	5394	PHYS REV B
GAO X	1991	44	10983	PHYS REV B
GAO X P	1993	97	507	BER BUNSEN PHYS CHEM
GAO X P	1994	98	8074	J PHYS CHEM-US
GAO X P	1991	67	618	PHYS REV LETT
GAO X P	1994	73	846	PHYS REV LETT
GERISCHER H	1985	89	4249	J PHYS CHEM-US
GERISCHER H	1987	91	1930	J PHYS CHEM-US
HAISS W	1995	386	267	J ELECTROANAL CHEM
HUBBARD A T	1988	88	633	CHEM REV
HUBBARD A T	1990	6	97	LANGMUIR
IBACH H	1997	375	107	SURF SCI
JAECKEL L	1994	39	1031	ELECTROCHIM ACTA
KOLB D M	1996	51	109	PROG SURF SCI
MEADE R D	1989	63	1404	PHYS REV LETT
MULLER J E	1986	56	1583	PHYS REV LETT

NYFFENEGGER R M	1996	100	17041	J PHYS CHEM-US
RANDIN J P	[illegible]72	36	257	J ELECTROANAL [illegible]EM
RANDIN J P	[illegible]71	118	711	J ELECTROCHEM [illegible]C
SANDER D	1992	272	318	SURF SCI
SAUERBREY G	1959	155	206	Z PHYS
SRINIVASAN R	1991	312	293	J ELECTROANAL CH INF
TAO N J	1994	98	1464	J PHYS CHEM-US
TAO N J	1994	98	7422	J PHYS CHEM-US
TAO N J	1995	11	4445	LANGMUIR
TAO N J	1994	301	L217	SURF SCI
WANG Y	1996	419	1	J ELECTROANAL CHEM
ZHANG J D	1996	364	L530	SURF SCI

L22 ANSWER 3 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 1
AN 1999:247083 BIOSIS
DN PREV199900247083
TI **DNA**-modified **electrodes** Part 3.: Spectroscopic characterization of **DNA**-modified gold **electrodes**.
AU Zhao, Yuan-Di; Pang, Dai-Wen (1); Hu, Shen; Wang, Zong-Li; Cheng, Jie-Ke; Qi, Yi-Peng; Dai, Hong-Ping; Mao, Bing-Wei; Tian, Zhong-Qun; Luo, Jin; Lin, Zhong-Hua
CS (1) Department of Chemistry, Wuhan University, Wuhan, 430072 China
SO Analytica Chimica Acta, (May 3, 1999) Vol. 388, No. 1-2, pp. 93-101. ISSN: 0003-2670.
DT Article
LA English
SL English
AB **DNA**-modified gold **electrodes** were characterized by scanning tunneling microscopy (STM), Raman spectroscopy, in situ UV/Vis reflection spectroscopy, X-ray photoelectron spectroscopy (XPS) and **alternating current** (AC) impedance. It has been found that dsDNA adsorbed firmly on gold surfaces lies strand-on in an ordered saturated monolayer, and ssDNA strands exist in a honeycomb-like form on the surfaces. The bases and phosphate groups of **DNA** backbone interacting with gold **electrode** surfaces play an important role in **DNA** immobilization onto gold **electrode** surfaces.
CC Biochemical Methods - General *10050
Comparative Biochemistry, General *10010
Biochemical Studies - General *10060
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biochemical Studies - Minerals *10069
Biophysics - General Biophysical Studies *10502
Biophysics - Molecular Properties and Macromolecules *10506
Biophysics - Bioengineering *10511
IT Major Concepts
Biochemistry and Molecular Biophysics; Equipment, Apparatus, Devices and Instrumentation; Methods and Techniques
IT Chemicals & Biochemicals
gold; **DNA**: Sino-American Biotechnical, immobilization, purification
IT Methods & Equipment
scanning tunneling microscopy: microscopy method, tunneling microscopy;
AC impedance measurement: Detection/Labeling Techniques, analytical method; **DNA**-modified gold **electrodes**: applications, characterization, laboratory equipment; LabRam I Confocal MicroRaman system: Dilor, equipment; Raman spectroscopy: analytical method, spectroscopic techniques: CB; UV/Vis reflection spectrophotometer: equipment; UV/Vis reflection spectroscopy: analytical method, spectroscopic techniques: CB; VG ESCA-LAB MKII spectrometer: laboratory
equipment; X-ray photoelectron spectroscopy: analytical method, spectroscopic techniques: CB
IT Miscellaneous Descriptors
electrochemistry

RN 7440-57-5 (GOLD)
14168-01-5 (DILOR)

L22 ANSWER 4 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 2
AN 1998:296792 BIOSIS
DN PREV199800296792
TI Preparation and hybridization analysis of **DNA/RNA** from E. coli on microfabricated bioelectronic chips.
AU Cheng, Jing (1); Sheldon, Edward L.; Wu, Lei; Uribe, Adam; Gerrue, Louis O.; Carrino, John; Heller, Michael J.; O'Connell, James P.
CS (1) Nanogen Inc., 10398 Pacific Center Ct., San Diego, CA 92121 USA
SO Nature Biotechnology, (June, 1998) Vol. 16, No. 6, pp. 541-546.
ISSN: 1087-0156.
DT Article
LA English
AB Escherichia coli were separated from a mixture containing human blood cells by means of dielectrophoresis and then subjected to electronic lysis
followed by proteolytic digestion on a single microfabricated bioelectronic chip. An **alternating current** electric field was used to direct the bacteria to 25 microlocations above individually addressable platinum microelectrodes. The platinum **electrodes** were 80 mum in diameter and had center-to-center spacings of 200 mum. After the isolation, the bacteria were lysed by a series of high-voltage pulses. The lysate contained a spectrum of **nucleic acids** including **RNA**, plasmid **DNA**, and genomic **DNA**. The lysate was further examined by electronically enhanced hybridization on separate bioelectronic chips. Dielectrophoretic separation of cells followed by electronic lysis and digestion on an electronically active chip may have potential as a sample preparation process for chip-based hybridization assays in an integrated **DNA/RNA** analysis system.
CC Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biochemical Methods - Nucleic Acids, Purines and Pyrimidines *10052
Biophysics - Bioengineering *10511
Physiology and Biochemistry of Bacteria *31000
BC Enterobacteriaceae 06702
IT Major Concepts
Biochemistry and Molecular Biophysics
IT Chemicals & Biochemicals
DNA: analysis, synthesis; **RNA**: analysis, synthesis
IT Methods & Equipment
hybridization analysis: methodological approach; microfabricated bioelectronic chips
IT Miscellaneous Descriptors
biotechnology
ORGN Super Taxa
Enterobacteriaceae: Facultatively Anaerobic Gram-Negative Rods, Eubacteria, Bacteria, Microorganisms
ORGN Organism Name
E. coli [Escherichia-coli] (Enterobacteriaceae)
ORGN Organism Superterms
Bacteria; Eubacteria; Microorganisms

L22 ANSWER 5 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 3
AN 1998:87924 BIOSIS
DN PREV199800087924
TI Electrochemical behaviors of **DNA** at mercury film **electrode**.
AU Wu, Jin-Tian,; Huang, Yin; Zhou, Jian-Zhang; Luo, Jin; Lin, Zhong-Hua (1)
CS (1) State Key Lab. Physical Chem. Solid Surfaces, Dep. Chem., Inst. Physical Chem., Xiamen Univ., Xiamen 361005 China
SO Bioelectrochemistry and Bioenergetics, (Nov., 1997) Vol. 44, No. 1, pp. 151-154.
ISSN: 0302-4598.

DT Article
LA English
AB **DNA** was studied by [redacted]ans of cyclic voltammetry (CV) [redacted] combination with a mercury film **electrode** (MFE) using conventional CV, differential pulse voltammetry (DPV), **alternating current** voltammetry (ACV). The MFE is sufficiently stable and can be used to study electrochemical behaviors of **DNA** in negative potential region. This means that MFE is ready to be one kind of solid **electrode** at which more useful electrochemical techniques can be carried out, such as spectroelectrochemical techniques, Redox characters of **DNA** treated by pure perchloric acid (HClO4) was studied at MFE. It seems that pure HClO4 would not only bring about the denaturation of **DNA** but the degradation of it. Pure HClO4 is not suitable for performing the denaturation of **DNA**.
CC Biochemical Methods - Nucleic Acids, Purines and Pyrimidines *10052
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biophysics - General Biophysical Techniques *10504
IT Major Concepts
Methods and Techniques; Molecular Genetics (Biochemistry and Molecular Biophysics)
IT Chemicals & Biochemicals
DNA: electrochemical behavior
IT Methods & Equipment
alternating current voltammetry: analytical method; cyclic voltammetry: analytical method; differential pulse voltammetry: analytical method; mercury film **electrode**: equipment
RN 7439-97-6 (MERCURY)

L22 ANSWER 6 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1995:224095 BIOSIS
DN PREV199598238395
TI Voltammetry of adsorbed cancerostatic actinomycins.
AU Ibrahim, M. S. (1); Ahmed, Z. A.; Temerk, Y. M.; Berg, H.
CS (1) Chem. Dep., Fac. Sci., Assiut Univ., Assiut Egypt
SO Bioelectrochemistry and Bioenergetics, (1995) Vol. 36, No. 2, pp. 149-156.
ISSN: 0302-4598.
DT Article
LA English
AB A systematic study of the adsorption and association of the cancerostatic drug actinomycin-C-1 (ACT) at a hanging mercury drop **electrode** (HMDE) has been conducted using phase-sensitive a.c. voltammetry and cyclic voltammetry (CV). At all bulk concentrations, the adsorbed layer is transformed into a condensed film by the significant stacking forces acting between adjacent rings of the phenoxazone residues. The nucleation and growth mechanism is confirmed and the data are analysed using the Avrami equation. The adsorption parameters for the condensed film were evaluated at various pH values. In addition, the preparative electrochemical reduction of ACT was performed using the large-scale electrolysis and differential pulse polarography. The consequences for **DNA** interaction and membrane adsorption are discussed.
CC Biochemical Studies - General *10060
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines 10062
Biochemical Studies - Minerals 10069
Biophysics - Molecular Properties and Macromolecules *10506
Biophysics - Membrane Phenomena *10508
Pharmacology - General *22002
Neoplasms and Neoplastic Agents - Therapeutic Agents; Therapy *24008
IT Major Concepts
Biochemistry and Molecular Biophysics; Membranes (Cell Biology); Pharmacology; Tumor Biology
IT Chemicals & Biochemicals
ACTINOMYCINS; ACTINOMYCIN C1; PHENOXAZONE; MERCURY
IT Miscellaneous Descriptors

ACTINOMYCIN C1; CONDENSED FILM; CYCLIC VOLTAMMETRY; **DNA** INTERACTION; DRUG MEMBRANE REACTION; ELECTROCHEMICAL REDUCTION; HANGING
MERCURY DROP **ELECTRODE**; PHASE-SENSITIVE **ALTERNATING CURRENT** VOLTAMMETRY; PHENOXAZONE
RN 1402-38-6D (ACTINOMYCINS)
50-76-0 (ACTINOMYCIN C1)
1916-63-8 (PHENOXAZONE)
7439-97-6 (MERCURY)

L22 ANSWER 7 OF 23 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.DUPLICATE 4
AN 94137126 EMBASE
DN 1994137126
TI Adsorption and association of 6-thiopurine and 6-thiopurine riboside at charged interfaces.
AU Ahmed Z.A.; Ahmed M.E.; Ibrahim M.S.; Kamal M.M.; Temerk Y.M.
CS Chemistry Department, Faculty of Science, Assiut University,Assiut, Egypt
SO Analytica Chimica Acta, (1994) 289/3 (329-337).
ISSN: 0003-2670 CODEN: ACACAM
CY Netherlands
DT Journal; Article
FS 027 Biophysics, Bioengineering and Medical Instrumentation
037 Drug Literature Index
LA English
SL English
AB A systematic study on the adsorption and association of 6-thiopurine (6-TP) and 6-thiopurine riboside (6-TPR) has been carried out at various pH values and the adsorption parameters were determined quantitatively. The adsorption was followed by out-of-phase **alternating current** voltammetry and cyclic voltammetry at a hanging mercury drop **electrode**. A comparative study was undertaken on the adsorption and association of the investigated thiopurines and the similar type of **nucleic acid** components containing purine bases. The base-containing thio group enhances stacking interaction and facilitates formation of the perpendicularly stacked layer on the **electrode** surface.
CT Medical Descriptors:
*adsorption
article
ph
potentiometry
priority journal
Drug Descriptors:
*mercaptopurine: AN, drug analysis
6 thiopurine riboside: AN, drug analysis
unclassified drug
RN (mercaptopurine) 31441-78-8, 50-44-2, 6112-76-1
CO Sigma (United States)

L22 ANSWER 8 OF 23 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 93:74543 SCISEARCH
GA The Genuine Article (R) Number: KK281
TI ELECTROPORATION OF INOSITOL 1,4,5-TRIPHOSPHATE INDUCES REPETITIVE CALCIUM OSCILLATIONS IN MURINE OOCYTES
AU RICKORDS L F; WHITE K L (Reprint)
CS UTAH STATE UNIV, CTR BIOTECHNOL, DEPT ANIM DAIRY & VET SCI, LOGAN, UT, 84322
CYA USA
SO JOURNAL OF EXPERIMENTAL ZOOLOGY, (01 FEB 1993) Vol. 265, No. 2, pp. 178-184.
ISSN: 0022-104X.
DT Article; Journal
FS LIFE; AGRI
LA ENGLISH

REC Reference Count: 39

AB The purpose of these experiments was to determine the effect of electroporation of IP3 into the cytosol of murine secondary oocytes and evaluate any alterations in [Ca2+]i resulting from Ca2+ release from intracellular stores. In addition, we evaluated the effect of ethanol (ETOH) on the release of Ca2+ from intracellular stores. Oocytes were loaded with the Ca2+ indicator fluo-3 by incubation in 100 mul drops of medium containing 2 muM fluo-3/AM for 60 min at 37-degrees-C. Changes in fluorescence were monitored by use of an inverted microscope which had been connected to a spectrofluorometer. Fluorescent intensity measurements were acquired for a minimum of 416 sec time span or up to 1,248 sec, with integration readings of 1 sec duration obtained every 2 sec throughout the measurement period. The experimental design consisted of comparing the rise in [Ca2+]i of fluo-3 loaded secondary oocytes subjected to electroporation in PBS and Ca2+-free PBS, each containing 25 muM IP3, to that elicited by PBS and Ca2+-free PBS containing a final concentration of 7% ETOH. Non-pulsed control secondary oocytes were placed in PBS + 25 muM IP3 during monitoring of [Ca2+]i fluorescence. Pulsed control secondary oocytes were placed in Ca2+-free PBS, subjected to electroporation pulse, and monitored for [Ca2+]i fluorescence.

Electroporation of IP3 was accomplished by placing fluo-3 loaded secondary oocytes between the **electrodes** of a glass slide fusion chamber which had been overlaid with 300 mul of PBS + 25 muM IP3 or Ca2+-free PBS + 25 muM IP3. A 5 sec, 3 volt, **alternating current** (AC) alignment pulse followed by a single, square wave, direct current (DC) fusion pulse of 1.56 kV.cm-1 for 99 musec was applied to the **electrodes**. For ETOH treatment, fluo-3 loaded secondary oocytes were placed in PBS or Ca2+-free PBS and allowed to equilibrate for 7 min in the dark. No pulse was applied to ETOH treatment secondary oocytes. Micropipets were used to keep the secondary oocyte in a fixed position throughout the measurement period. After a 20 sec baseline fluorescent reading was obtained, fluorescent measurement was interrupted and 150 mul of PBS (or Ca2+-free PBS) was removed and replaced with 150 mul of 14% ETOH in PBS (or Ca2+-free), bringing the final concentration after equilibration to 7% ETOH. Fluorescent intensity measurement resumed immediately following the addition of 14% ETOH. A dramatic and immediate rise in [Ca2+]i was observed upon application of electropolation pulse and [Ca2+]i was maintained at an elevated level for a minimum of 14 min. Repetitive [Ca2+]i oscillations were obtained in mouse secondary oocytes after electroporation of 25 muM IP3 in Ca2+-free PBS that occurred for 20.5 min with a gradual increase in the interval between [Ca2+]i oscillation peaks over time. After ETOH treatment, a dramatic rise in mouse secondary oocyte [Ca2+]i in PBS and Ca2+-free PBS was observed. There was no significant different ($P > 0.05$) in [Ca2+]i between PBS + ETOH and Ca2+-free PBS + ETOH, indicating the rise in [Ca2+]i resulted from a release of Ca2+ from intracellular stores. The ability to consistently produce repetitive [Ca2+]i oscillations may aid in the study of post-fertilization development and cell cycle events. Current studies are being conducted to determine if IP3 can be used to enhance the rate of electric pulse induced parthogenesis and subsequent development.

CC ZOOLOGY

STP KeyWords Plus (R): GOLDEN-HAMSTER EGGS; SEA-URCHIN EGGS; INTRACELLULAR FREE CALCIUM; HYPERPOLARIZING RESPONSES; PERIODIC INCREASE; BINDING PROTEIN; ELECTRIC-FIELDS; XENOPUS-LAEVIS; **DNA**-SYNTHESIS; FERTILIZATION

RF 92-6934 002; TRANSMITTER RELEASE INCREASES INTRACELLULAR CALCIUM; INOSITOL TRISPHOSPHATE IN XENOPUS OOCYTES; MOUSE THYMOCYTES
92-2219 001; PROTEIN-KINASE-C ISOFORMS; PHORBOL ESTER; CULTURED RAT

MESANGIAL CELLS

RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
BERRIDGE M J	1988	403	589	J PHYSIOL-LONDON
BERRIDGE M J	1984	312	315	NATURE
BUSA W B	1985	101	677	J CELL BIOL
COLONNA R	1989	24	171	GAMETE RES
CUTHBERTSON K S R	1981	294	754	NATURE
CUTHBERTSON K S R	1985	316	541	NATURE
EPEL D	1982	2	355	CALCIUM CELL FUNCTIO
EPEL D	1990	29	1	CELL DIFFER DEV
EPEL D	1978	12	185	CURR TOP DEV BIOL
HAN J K	1990	110	1103	J CELL BIOL
IGUSA Y	1983	340	611	J PHYSIOL-LONDON
IGUSA Y	1983	340	633	J PHYSIOL-LONDON
IGUSA Y	1986	377	193	J PHYSIOL-LONDON
JAFFE L A	1983	96	317	DEV BIOL
JAFFE L F	1985		127	BIOL FERTILIZATION
JAFFE L F	1983	99	265	DEV BIOL
KAO J P Y	1989	264	8179	J BIOL CHEM
KAUFMAN M H	1983		20	EARLY MAMMALIAN DEV
KAUFMAN M H	1982	71	139	J EMBRYOL EXP MORPH
MCCULLOH D H	1983	95	372	DEV BIOL
MINTA A	1989	264	8171	J BIOL CHEM
MIYAZAKI S	1991	12	205	CELL CALCIUM
MIYAZAKI S	1986	118	259	DEV BIOL
MIYAZAKI S	1988	106	345	J CELL BIOL
MIYAZAKI S	1988	50	390	J PHYSL SOC JAPAN
MIYAZAKI S	1981	290	702	NATURE
MIYAZAKI S	1982	79	931	P NATL ACAD SCI USA
OZAWA H	1989	138	477	J CELL PHYSIOL
OZIL J P	1990	109	117	DEVELOPMENT
RICKORDS L F	1992	31	152	MOL REPROD DEV
RODAN G A	1978	199	690	SCIENCE
STEINHARDT R A	1988	332	364	NATURE
SWANN K	1990	110	1295	DEVELOPMENT
SWANN K	1986	103	2333	J CELL BIOL
TURNER P R	1986	102	70	J CELL BIOL
WHITAKER M	1990	108	525	DEVELOPMENT
WHITAKER M	1984	312	636	NATURE
WHITAKER M J	1989		459	INOSITOL LIPIDS CELL
WOOD M J	1987		255	MAMMALIAN DEV PRACTI

L22 ANSWER 9 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 5
AN 1990:517072 BIOSIS
DN BA90:134348
TI **ALTERNATING CURRENT** VOLTAMMETRIC DETERMINATION OF **DNA** DAMAGE.
AU KRZNARIC D; COSOVIC B; STUEBER J; ZAHN R K
CS CENT. MARINE RES. ZAGREB, RUDER BOSKOVIC INST., BIJENICKA 54, 41000 ZAGREB, YUGOSL.
SO CHEM-BIOL INTERACT, (1990) 76 (1), 111-128.
CODEN: CBINA8. ISSN: 0009-2797.
FS BA; OLD
LA English
AB The conditions for **alternating current** (a.c.) voltammetric **DNA** determinations have been investigated with respect to its use with alkaline filter elution techniques at low **DNA** concentrations. In inorganic electrolyte solutions three current peaks can be distinguished: peak I around -1.1 V caused by the reorientation or desorption of **DNA** segments; peak II around -1.2 V caused by the native **DNA** (nDNA) form; peak III caused by denatured **DNA** (dDNA) at -1.4 V. Sonication of nDNA increases the

peak current, however not with dDNA. Both dDNA and nDNA give linear peak current increments with **DNA** increments, their regression lines cutting the concentration axis at the origin. In filter elution techniques organic bases are often used. Adding ethanolamine (EA) elution buffer decreases the peak amplitude of **DNA**. It turns out that an unknown substance, perhaps a protein or **RNA**, elutes from the filters and gives rise to a current peak at about -1.3 V. This substance can interfere with the dDNA by competing for **electrode** surface area, since it diffuses much faster than the large molecules of the **DNA**. Since however, dDNA has a higher affinity for the **electrode** surface, after enough time, usually few minutes, the dDNA increasingly displaces the substance and occupies the surface. The same is valid for other organic molecules and thus also for EA. It is therefore remarkable that the unknown substance can be altered by ultrasonication, so that it will no longer interfere with dDNA, in contrast to EA. EA, on the other hand, can be "titrated". When EA is present at short accumulation times it prevents dDNA adsorption. By adding dDNA, the EA can be scavenged and further addition will adsorb and thus increase peak current in proportion to the concentration of the **DNA** present. The conditions for voltammetric **DNA** determination have been investigated obeying the recognized interactions. Avoiding organic bases and using inorganic ones would simplify the determination procedure. The reproducibility of the procedure in the range of 50-60 ng **DNA**/ml has been found to be .+-. 6%.

CC Genetics and Cytogenetics - Animal *03506
Biochemical Methods - Nucleic Acids, Purines and Pyrimidines 10052
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biophysics - Molecular Properties and Macromolecules *10506
External Effects - Electric, Magnetic and Gravitational Phenomena *10610
External Effects - Physical and Mechanical Effects *10612

IT Miscellaneous Descriptors
HOLOTHURIA-TUBULOSA

L22 ANSWER 10 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1990:127494 BIOSIS
DN BA89:66305
TI CYCLIC VOLTAMMETRY OF METAL-POLYELECTROLYTE COMPLEXES COMPLEXES OF CADMIUM AND LEAD WITH **DNA**.
AU SEQUARIS J-M; ESTEBAN M
CS INST. APPLIED PHYSICAL CHEM., NUCLEAR RES. CENTER KFA JUELICH, P.O. BOX 1913, D-5170 JUELICH, WEST GERMANY.
SO ELECTROANALYSIS, (1990) 2 (1), 35-42.
CODEN: ELANEU. ISSN: 1040-0397.
FS BA; OLD
LA English
AB Cyclic voltammetry was used for the determination of the association constants of Pb2+ and Cd2+ with deoxyribonucleic acid. The adsorption of the biological polyelectrolyte at the mercury **electrode** surface was controlled by the **alternating current** voltammetric method, which permits corrective factors to be introduced in the evaluation of cyclic voltammetric responses. The results are based on the analysis of the labile complexaton of the slow-diffusing **DNA** by studying the current intensity peak as well as the peak potential shift of Pb2+ and Cd2+. The association constants (.beta.) obtained from the two treatments are in satisfactory agreement. The dependence of the conditional association constant (.beta.1) for the Cd-**DNA** system on the monovalent ion (Na+) concentration is also reported.

CC Biochemical Methods - General *10050
Biochemical Methods - Nucleic Acids, Purines and Pyrimidines *10052
Biochemical Methods - Minerals *10059

Biochemical Studies - Nucleic Acids, Purines and Pyrimidines 10062
Biochemical Studies - Minerals 10069
Biophysics - General Biophysical Techniques *10504
Biophysics - Molecular Properties and Macromolecules *10506
External Effects - Electric, Magnetic and Gravitational Phenomena *10610
IT Miscellaneous Descriptors
CONDITIONAL ASSOCIATION CONSTANT ASSOCIATION CONSTANT CURRENT INTENSITY
PEAK PEAK POTENTIAL SHIFT
RN 7439-92-1 (LEAD)
7440-43-9D (CADMIUM)

L22 ANSWER 11 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1988:151829 BIOSIS
DN BA85:75482
TI ELECTRIC FIELD EFFECTS IN **NUCLEIC ACIDS** ADSORPTION OF ADENINE AT THE NEGATIVELY CHARGED **ELECTRODE**.
AU VETTERL V; JANCAR J; ZALUDOVA R
CS INST. BIOPHYS., CZECH. ACAD. SCI., 612 65 BRNO, CZECH.
SO FOLIA FAC SCI NAT UNIV PURKYNIANAE BRUN BIOL, (1987) 0 (85), 85-94.
CODEN: FFUBAP.
FS BA; OLD
LA English
AB The **alternating current** polarograms of adenine at different pH were measured. With increasing concentration of adenine a sort of pit appears on the a.c. polarograms near the potential of the electrocapillary maximum, indicating the region of potentials at which the adsorbed adenine molecules associate. Besides the pit occurring in the vicinity of the electrocapillary maximum potential a more negative pit around the potential of -1.2 V was observed in the pH range 3.9-5.5 at high concentrations of adenine. This more negative pit corresponds to the association of adenine molecules electrostatically adsorbed to the mercury surface.
CC Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biophysics - General Biophysical Techniques 10504
Biophysics - Molecular Properties and Macromolecules *10506
External Effects - Electric, Magnetic and Gravitational Phenomena *10610
IT Miscellaneous Descriptors
ALTERNATING CURRENT POLAROGRAM
RN 73-24-5 (ADENINE)

L22 ANSWER 12 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 6
AN 1987:61960 BIOSIS
DN BA83:30286
TI **ALTERNATING CURRENT** VOLTAMMETRIC DETERMINATION OF **DNA** CONCENTRATIONS AT A MICROGRAM PER LITER LEVEL.
AU KRZNARIC D; COSOVIC B
CS CENT. MARINE RES. ZAGREB, RUDJER BOSKOVIC INST., ZAGREB, YUGOSLAVIA.
SO ANAL BIOCHEM, (1986) 156 (2), 454-462.
CODEN: ANBCA2. ISSN: 0003-2697.
FS BA; OLD
LA English
AB **Alternating current** voltammetry is used as a fast and highly sensitive method of **DNA** detection, at a microgram per liter level. The method is based on the measurement of adsorption effects of denatured **DNA** at the hanging mercury drop **electrode** . The proposed procedure consists of thermal denaturation of **DNA** , which is followed by electrochemical detection of denatured **DNA** . A sharp adsorption peak of denatured **DNA**, at the potential of -1.4 V, is measured in 0.3 mol/liter NaCl and 0.03 mol/liter NaHCO3 (pH about 9) after an accumulation of **DNA** at the **electrode** surface. To enhance the sensitivity, the solution is stirred during

adsorption. The influence of proteins, a polysaccharide, and **RNA** on the **DNA** determination was also studied.

CC Biochemical Methods - Nucleic Acids, Purines and Pyrimidines *10052
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines 10062
Biochemical Studies - Proteins, Peptides and Amino Acids 10064
Biochemical Studies - Carbohydrates 10068
Biophysics - General Biophysical Techniques *10504

L22 ANSWER 13 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1982:233058 BIOSIS
DN BA74:5538
TI POLAROGRAPHY OF CIRCULAR **DNA**.
AU VOJTISKOVA M; LUKASOVA E; JELEN F; PALECEK E
CS INST. BIOPHYSICS, CZECHOSLOVAK ACADEMY OF SCI., KRALOVOPOLSKA 135, 612 65,
BRNO, CZECHOSLOVAKIA.
SO BIOELECTROCHEM BIOENERG, (1981) 8 (5), 487-496.
CODEN: BEBEBP. ISSN: 0302-4598.
FS BA; OLD
LA English
AB Closed duplex (cd) and open circular (oc) forms of **DNA** of the plasmid Col E1 were studied by means of AC and differential pulse polarography (dpp). Adsorption properties of oc **DNA** (at pH 8) agreed in principle with those of linear **DNA**, cd **DNA** was less firmly adsorbed at the dme (dropping mercury **electrode**), compared with oc **DNA**. At low ionic strengths cd **DNA** was adsorbed at potentials more positive than the pzc via unscreened, negatively charged phosphates, and around -0.55 V (vs. sce (saturated calomel **electrode**)) it produced a much higher tensammetric peak than oc **DNA**. At moderate ionic strengths oc **DNA** produced a well-developed peak 1 at about -1.1 V. Peak I of cd **DNA** was considerably smaller, in accord with a much weaker adsorption of this **DNA** at a potential more negative than the pzc. Under conditions suitable for the polarographic reduction of single-stranded **DNA**, cd **DNA** behaved as non-reducible, as detected by the absence of dpp peaks in the potential region from -1.3 to -1.5 V. oc **DNA** produced dpp peak II, so far observed only with linear double-stranded **DNA**. Thermally denatured oc **DNA** produced a high peak III characteristic for denatured **DNA**. A dpp method for the determination of oc **DNA** in samples of cd **DNA** was designed. The experimental data obtained were utilized for explaining the role of bases in the interaction of a polynucleotide molecule with the dme
and for elucidating some changes in **DNA** conformation in the bulk of solution.

CC Biochemical Methods - Nucleic Acids, Purines and Pyrimidines *10052
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biophysics - General Biophysical Techniques *10504
Biophysics - Molecular Properties and Macromolecules 10506
Physiology and Biochemistry of Bacteria *31000
Genetics of Bacteria and Viruses 31500
Microbiological Apparatus, Methods and Media 32000
BC Enterobacteriaceae 04810
IT Miscellaneous Descriptors
COL-E-1 PLASMID CLOSED DUPLEX **DNA** OPEN CIRCULAR **DNA**
SINGLE STRANDED **DNA** DOUBLE STRANDED **DNA** DENATURED
DNA LINEAR **DNA** INTERCALATION CONFORMATION
ALTERNATING CURRENT POLAROGRAPHY DIFFERENTIAL PULSE
POLAROGRAPHY

L22 ANSWER 14 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1980:200942 BIOSIS
DN BA69:75938
TI INTERACTION OF **NUCLEIC-ACIDS** WITH ELECTRICALLY CHARGED SURFACES 7. THE EFFECT OF IONIC STRENGTH OF NEUTRAL MEDIUM ON THE

CONFORMATION OF **DNA** ADSORBED ON THE MERCURY **ELECTRODE**.
AU BRABEC V
CS INST. BIOPHYS., CZE[redacted]. ACAD. SCI., 61265 BRNO, CZECH[redacted]
SO BIOPHYS CHEM, (1980) 11 (1), 1-8.
CODEN: BICIAZ. ISSN: 0301-4622.
FS BA; OLD
LA English
AB Triangular-wave direct current (DC) voltammetry at a hanging mercury drop **electrode** and phase-selective **alternating current** (AC) polarography at a dropping mercury **electrode** were used for the investigation of adsorption of double-helical (ds) **DNA** at mercury **electrode** surfaces from neutral solutions of 0.05-0.4 M HCOONH4. It was found for the potential region T (from -0.1 V up to approximately -1.0 V) that the height of voltammetric peaks of ds **DNA** is markedly influenced by the initial potential only at relatively low ionic strength (.mu.) (from 0.05 up to approximately 0.3). A decrease of differential capacity (measured by means of AC polarography) in the region T depended markedly on the **electrode** potential only at relatively low ionic strength. The following conclusions were made concerning the interaction of ds **DNA** with a mercury **electrode** charged to potentials of the region T in neutral medium of relatively low ionic strength (.mu. < 0.3). When ds **DNA** is adsorbed, a significantly higher number of **DNA** segments is anchored in the positively charged **electrode** surface than in the surface bearing a negative charge. In the region T, especially adsorbed labile regions of ds **DNA** are opened in the **electrode** surface, which are present in ds **DNA** already in the bulk of the solution. In the narrow region of potentials in the vicinity of the zero charge potential a higher number of ds **DNA** segments can be opened, probably as a consequence of the strain which could act on the ds **DNA** molecule in the course of the segmental adsorption/desorption process.
CC Biochemical Methods - Nucleic Acids, Purines and Pyrimidines 10052
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines *10062
Biophysics - General Biophysical Techniques 10504
Biophysics - Molecular Properties and Macromolecules *10506
RN 7439-97-6 (MERCURY)

L22 ANSWER 15 OF 23 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 7
AN 1978:187819 BIOSIS
DN BA66:316
TI **ALTERNATING CURRENT** POLAROGRAPHIC INVESTIGATION OF POLY SACCHARIDES IN **DNA**.
AU MALFOY B; REYNAUD J A
CS CENT. BIOPHYS. MOL., 45045 ORLEANS CEDEX, FR.
SO ANAL BIOCHEM, (1978) 84 (1), 1-11.
CODEN: ANBCA2. ISSN: 0003-2697.
FS BA; OLD
LA English
AB Polysaccharides alone or in the presence of **DNA** are studied by AC polarography. When neutral and basic polysaccharides are used, the polarograms recording the quadratic component of the current display 1 capacitive peak at -1650 mV (SCE [saturated calomel **electrode**]). Acid polysaccharides never show this peak and are desorbed from the **electrode** at more positive potentials. If dextran is used as a reference, this peak allows the determination of the amount of neutral polysaccharides in solution up to 2 .mu.g/ml. The height of this peak has no relation to the ionic strength or pH of the solution within the investigated range. The concentration and MW of **DNA** enclosed in the solution exert no influence on the peak height. The presence of polysaccharides causes **DNA** peaks to decrease considerably. AC polarography can be regarded as a quick, convenient and sensitive method for performing the titration of polysaccharides alone or mixed with

DNA.

CC Biochemical Methods - Nucleic Acids, Purines and Pyrimidines *10052
Biochemical Methods - Carbohydrates *10058
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines 10062
Biochemical Studies - Carbohydrates 10068
Biophysics - General Biophysical Techniques *10504

L22 ANSWER 16 OF 23 CAPLUS COPYRIGHT 2000 ACS
AN 1975:125551 CAPLUS
DN 82:125551
TI Adsorption of **DNA** at the mercury-electrolyte interface. V. Influence of temperature on the structure of the adsorption layer of **DNA**
AU Flemming, J.
CS Zentralinst. Mikrobiol. Exp. Ther., DAW, Jena, E. Ger.
SO Stud. Biophys. (1974), 45,, 21-7
CODEN: STBIBN
DT Journal
LA English
CC 33-7 (Carbohydrates)
Section cross-reference(s): 22
AB The temp. influence on the adsorption layer of **DNA** at the interface between a hanging Hg drop **electrode** and a buffered aq. NaCl soln. was detd. via **alternating current** polarography and the differential capacity was measured at several potentials. The extending of adsorbed **DNA** mols. into soln. increased with increasing temp. and from these measurements the premelting and denaturation of **DNA** can be estd.
ST **DNA** adsorption temp dependence; mercury **electrode** **DNA** adsorption; polarography **DNA** adsorption
IT Deoxyribonucleic acids
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(adsorption of, effect of temp. on)
IT Adsorption
(of deoxyribonucleic acids, effect of temp. on)

L22 ANSWER 17 OF 23 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.
AN 75001532 EMBASE
DN 1975001532
TI The relation between adsorbability and polarographic reducibility of single stranded polynucleotides.
AU Brabec V.; Palecek E.
CS Inst. Biophys., Czech. Acad. Sci., Brno, Czechoslovakia
SO Studia Biophysica, (1974) 42/1 (1-6).
CODEN: STBIBN
DT Journal
FS 029 Clinical Biochemistry
LA English
AB Interactions of single stranded polycytidylic acid (poly(C)) with mercury **electrode** were followed by means of direct current (dc) and **alternating current** (ac) polarography. It was found that the polarographic reduction of poly (C) takes place only in the adsorbed state. The reduction limiting currents of poly (C) exhibited properties typical for adsorption currents in agreement with the above finding. Different shapes of dc polarographic curves of poly (C) could be explained in the same way as those of denatured **DNA** and polyadenylic acid (poly (A)) by inhibition of reduction current due to polynucleotide desorption from the negatively charged surface of mercury **electrode**. The character of the **electrode** process which is responsible for reduction of poly (C) on mercury **electrode** was similar to the character of the process at which denatured **DNA** and poly (A) were reduced.
CT Medical Descriptors:

in vitro study
theoretical study
methodology
Drug Descriptors:
***dna**
*polycytidylic acid
*polynucleotide
RN (**dna**) 9007-49-2; (polycytidylic acid) 30811-80-4

L22 ANSWER 18 OF 23 CAPLUS COPYRIGHT 2000 ACS
AN 1972:430499 CAPLUS
DN 77:30499
TI Interactions of polynucleotides with the mercury **electrode**
AU Brabec, V.; Palecek, E.
CS Inst. Biophys., Czech. Acad. Sci., Brno, Czech.
SO Proc. Conf. Appl. Phys. Chem., 2nd (1971), Volume 1, 523-7. Editor(s): Buzas, Ilona. Publisher: Akad. Kiado, Budapest, Hung.
CODEN: 24IUAO
DT Conference
LA English
CC 6-2 (General Biochemistry)
Section cross-reference(s): 9
AB Adsorption of polynucleotides was studied by means of Breyer **alternating current** (a.c.) polarog. According to the a.c. polarog. behavior of various model compds. a scheme of adsorption of polynucleotides was suggested. In medium of higher ionic strength, when the charges of phosphate groups of **DNA** were screened by ions of the electrolyte, double-helical **DNA** was adsorbed as an electroneutral substance. Under low ionic strength, the segment of double-helical **DNA** in which all the charges of phosphate groups were not screened were adsorbed on the pos. **electrode** surface. Single-stranded polynucleotides were adsorbed on the Hg **electrode** mainly through bases.
ST mercury **electrode** polynucleotide interaction
IT Chains, chemical
(helical conformation of, of polynucleotides, mercury **electrode** interaction in relation to)
IT **Electrodes**
(mercury, adsorption of polynucleotides, helical conformation in relation to)
IT Adsorption
(of polynucleotides on mercury **electrode**, helical conformation in relation to)
IT Nucleotides, properties
RL: PRP (Properties)
(poly-, adsorption on mercury **electrode**, helical conformation in relation to)
IT Ions in liquids
(strength of, polynucleotide adsorption on mercury **electrode** and helical conformation in relation to)

L22 ANSWER 19 OF 23 CAPLUS COPYRIGHT 2000 ACS
AN 1969:74287 CAPLUS
DN 70:74287
TI Adsorption of **DNA** in the mercury-electrolyte interface
AU Flemming, Joachim
CS Deut. Akad. Wiss. Berlin, Jena, E. Ger.
SO Biopolymers (1968), 6(12), 1697-703
CODEN: BIPMAA
DT Journal
LA German
CC 2 (General Biochemistry)
AB The adsorption of **DNA** in the Hg-electrolyte interface has been investigated. The effect of this adsorption on the differential capacity of the elec. double layer between a polarized Hg surface and a 0.15M NaCl

soln. contg. **DNA** was measured by means of the **alternating current** polarography (Breyer polarograph). The effective a.c. under actual conditions (adsorption processes only, small electrolytic resistance, small a.c. frequency, and a.c. amplitude) is directly proportional to the differential double layer capacity. The combination of this method with the application of a stationary Hg drop **electrode** allows the coverage of the **electrode** to be followed continuously in the range 0.2 sec. to .apprx.60 sec. The diffusion is the rate-controlled step of the adsorption kinetics. Therefore the lowering of the a.c. by the adsorbed **DNA** is proportional to the surface concn. for partly covered surfaces and reaches a const. value after the surface becomes fully covered. Adsorption of further layers does not affect the differential capacity. This makes it possible to det. the max. surface concn. of the **DNA**. For that it is necessary to det. the diffusion coeff. of **DNA**. The surface concns. of the native **DNA** and the relative surface concns. of the denatured **DNA** in dependence on the potential of the polarized Hg surface were estd. Both surface concns. show a pronounced dependence on the potential with a min. of the surface concn. around -0.4 v. with respect to the normal calomel **electrode**. This property may be caused by the structure of the adsorption layer depending on the potential. That means that only several segments of the rigid **DNA** mols. are adsorbed and the other ones remain in the soln. near the surface. The adsorption in the neighborhood of the electrocapillary zero potential at -0.4 v. is strongest, and therefore the fraction of the adsorbed segments has a max. At these potentials consequently, the max. coverage is already reached at relatively low surface concns.

ST **DNA** adsorption Hg **electrode**; mercury **electrode** adsorption **DNA**

IT **Nucleic acids**, deoxyribo-
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(adsorption of, in mercury-electrolyte interface in polarography)

L22 ANSWER 20 OF 23 CAPLUS COPYRIGHT 2000 ACS
AN 1971:60984 CAPLUS
DN 74:60984
TI Adsorption of **DNA** in the mercury-electrolyte interface
AU Flemming, Joachim
CS Inst. Mikrobiol. Exptl. Ther., Dtsch. Akad. Wiss. Berlin, Jena, Ger.
SO Stud. Biophys. (1968), 8, 209-12
CODEN: STBIBN
DT Journal
LA German
CC 2 (General Biochemistry)
AB The adsorption of **DNA** at mercury-electrolyte interfaces has been investigated by means of **alternating current** polarography. The structure of the adsorption layer depends on the potential of the interface. The adsorption denaturation of the **DNA** in this interface as supposed by Miller (1961) could not be confirmed.

ST **DNA** mercury **electrode**; mercury **DNA** **electrode**; **electrode DNA** mercury

IT **Nucleic acids**, deoxyribo-
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(adsorption of, at mercury-electrolyte interface in polarography)

L22 ANSWER 21 OF 23 CAPLUS COPYRIGHT 2000 ACS
AN 1968:464113 CAPLUS
DN 69:64113
TI **Alternating current** polarography of nucleosides
AU Vetterl, Vladimir
CS Ceskoslov. Akad. Ved, Brno, Czech.

SO J. Electroanal. Chem. Interfacial Electrochem. (1968), 19(1/2), 169-73
CODEN: JEIEBC
DT Journal
LA English
CC 77 (Electrochemistry)
AB The a.c. polarography of nucleosides currently occurring in **nucleic acids** was studied by using the method of V. Vetterl (1966) for measuring the differential capacity of the **electrode** double-layer. The potentials were measured relative to the S.C.E. and the concn.-dependence of the shapes of the a.c. polarograms is presented. The a.c. polarograms of nucleosides currently occurring in **nucleic acids** exhibit a min. at .apprx.-0.4 v., caused by the adsorption of nucleosides on the **electrode** surface. At higher concns. of deoxycytidine (I), adenosine (II), guanosine, and deoxyguanosine, assocn. of the adsorbed mols. occurs in the vicinity of -0.4 v. With deoxyadenosine, assocn. of the mol. occurs at .apprx.-1.2 v. and with II, at both -0.4 and -1.2 v. As with bases, the transition from the nonassocd. to the assocd. state occurs over a closed concn. interval in which the adsorption isotherm has an inflection point. With uridine, thymidine, and cytidine (III), no assocn. of the adsorbed mols. was observed even at concns. approaching satn. value. At pH 7.0, most of the nucleosides studied were polarographically nonreducible and the max. observed on the a.c. polarograms are of a capacitive character. Only the peak for III and I at -1.6 v. is caused by a redn. of cytosine. 20 references.
ST polarog ac nucleosides; nucleosides ac polarog
IT Guanosine
RL: PROC (Process)
(polarography of, a.c.)
IT 50-89-5, reactions 58-61-7, reactions 58-96-8 65-46-3 951-77-9 961-07-9
RL: RCT (Reactant)
(polarography of, a.c.)

L22 ANSWER 22 OF 23 CAPLUS COPYRIGHT 2000 ACS
AN 1967:73136 CAPLUS
DN 66:73136
TI **Alternating-current** polarographic criteria of **nucleic acid** denaturation
AU Berg, Hermann; Baer, Horst; Gollmick, F. A.
CS Deut. Akad. Wiss., Berlin, Ger.
SO Biopolymers (1967), 5(1), 61-8
CODEN: BIPMAA
DT Journal
LA German
CC 6 (Biochemical Methods)
AB Electrochem. analyses of high-mol.-wt. **nucleic acids** are restricted to the detn. of the adsorption behavior. A.c. polarography (Breyer polarography) can be used for characterizing changes in the secondary structure of **DNA**. The polarogram shows the a.c. of the dropping **electrode** in dependence of the potential which ranged 0-2 v. neg. relative to the normal calomel **electrode**. By addn. of native **DNA** to the supporting electrolyte, the current drops in the range of absorption between 0 and 1 v. At 1.16 v., desorption takes place and is indicated by the appearance of a broad desorption peak. Denaturation of the double helix causes a sharp desorption peak at neg. potentials of the a.c. polarogram. This new criterion for the helix-coil transition is due to the formation of unpaired bases which undergo a specific absorption within a narrow potential range. In the alk. range, the sharp peak increases and reaches its max. at pH >12. In the acid range, no sharp peak is found and the broad desorption peak decreases. The best way of following conformational

changes is, therefore, to measure the current difference between the curves of the solu[redacted] with and without **DNA** at electr[redacted]apillary zero potential. M[redacted]eover, the scission of the mol[redacted]y ultrasonic action can be followed by the increase of the broad peak of **DNA** in the absence of any sharp peak.

ST POLAROG **DNA** DENATURATION; **DNA** DENATURATION POLAROG; DENATURATION **DNA** POLAROG

IT Polarography
(**alternating-current**, in structure(secondary) studies)

IT **Nucleic acids**, deoxyribo-
RL: PRP (Properties)
(structure of, helix-coil transition in, detection by **alternating- current** polarography)

L22 ANSWER 23 OF 23 CAPLUS COPYRIGHT 2000 ACS
AN 1967:479518 CAPLUS
DN 67:79518
TI Adsorption behavior of **nucleic acids** from current-time curves and **alternating current** polarograms
AU Flemming, Joachim; Berg, Hermann
CS Deut. Akad. Wiss., Berlin, Ger.
SO Abh. Dtsch. Akad. Wiss. Berlin, Kl. Med. (1966), (4), 559-63
CODEN: ADWMAX
DT Journal
LA German
CC 6 (Biochemical Methods)
AB The adsorption of **nucleic acids** at a dropping-Hg **electrode** was investigated by measuring the effect of the **nucleic acid** on the polarographic current-time curves of Cu-EDTA depolarizer and on Breyer **alternating current** polarograms. The adsorption of **RNA** and calf thymus **DNA** was diffusion controlled. The time for complete coverage of the Hg droplet with **nucleic acid** was obtained from the current-time curves for **RNA**, but not for **DNA**, because the overall **electrode** reaction of the depolarizer was inhibited too weakly. The course of thermal or photochem. denaturation of **DNA** could then be followed.

ST POLAROG **DNA**; **DNA** POLAROG; **RNA** POLAROG; BERG H; FLEMMING J

IT **Nucleic acids**, deoxyribo-
Nucleic acids, ribo-
RL: PROC (Process)
(polarography of)

ANSWER 1 OF 16 BIOSIS COPYRIGHT 2000 BIOSIS

AN 1993:24620 BIOSIS

DN PREV199395012820

TI Quantification of fluorescence in situ hybridization signals by image cytometry.

AU Nederlof, P. M.; Van Der Flier, S.; Verwoerd, N. P.; Vrolijk, J.; Raap, A.
K. (1); Tanke, H. J.

CS (1) Sylvius Lab., Dep. Ctyochem. Cytometry, Univ. Leiden, Wassenaarseweg 72, 2333 Al Leiden Netherlands

SO Cytometry, (1992) Vol. 13, No. 8, pp. 846-852.
ISSN: 0196-4763.

DT Article

LA English

AB In this study we aimed at the development of a cytometric system for quantification of specific **DNA** sequences using fluorescence in situ hybridization (ISH) and digital imaging microscopy. The cytochemical and cytometric aspects of a quantitative ISH procedure were investigated, using human peripheral blood lymphocyte interphase nuclei and probes detecting high copy number target sequences as a model system. These chromosome-specific probes were labeled with biotin, digoxigenin, or fluorescein. The instrumentation requirements are evaluated. Quantification of the fluorescence ISH signals was performed using an epi-fluorescence microscope with a multi-wavelength illuminator, equipped with a cooled charge coupled device (CCD) camera. The performance of the system was evaluated using fluorescing beads and a homogeneosuly fluorescing specimen. Specific image analysis programs were developed for the automated segmentation and analysis of the images provided by ISH. Non-uniform background fluorescence of the nuclei introduces problems in the image analysis segmentation procedures. Different procedures were tested. Up to 95% of the hybridization signals could be correctly segmented using **digital filtering** techniques (min-max filter) to estimate local background intensities. The choice of the objective lens used for the collection of images was found to be extremely important. High magnification objectives with high numerical aperture, which are frequently used for visualization of fluorescence, are not optimal, since they do not have a sufficient depth of field. The system described was used for quantification of ISH signals and allowed accurate measurement of fluorescence spot intensities, as well as of fluorescence ratios obtained with double-labeled probes.

CC Microscopy Techniques - Cytology and Cytochemistry *01054
Cytology and Cytochemistry - Human *02508
Genetics and Cytogenetics - Human *03508
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines 10062
Blood, Blood-Forming Organs and Body Fluids - Lymphatic Tissue and Reticuloendothelial System *15008

BC Hominidae *86215

IT Major Concepts
Blood and Lymphatics (Transport and Circulation); Cell Biology; Genetics; Methods and Techniques

IT Miscellaneous Descriptors
DNA CONTENT; HUMAN PERIPHERAL BLOOD LYMPHOCYTE

ORGN Super Taxa
Hominidae: Primates, Mammalia, Vertebrata, Chordata, Animalia

ORGN Organism Name
Hominidae (Hominidae)

ORGN Organism Superterms
animals; chordates; humans; mammals; primates; vertebrates

L30 ANSWER 2 OF 16 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1992:497252 BIOSIS
DN BA94:115777
TI BEHAVIOR OF PERIOD-ALTERED CIRCADIAN RHYTHM MUTANTS OF DROSOPHILA IN LIGHT
DARK CYCLES DIPTERA DROSOPHILIDAE.
AU HAMBLEN-COYLE M J; WHEELER D A; RUTILA J E; ROSBASH M; HALL J C
CS 235 BASSINE BUILD., BRANDEIS UNIV., WALTHAM, MASS. 02254-9110.
SO J INSECT BEHAV, (1992) 5 (4), 417-446.
CODEN: JIBEE8.
FS BA; OLD
LA English
AB Adults of Drosophila melanogaster had their locomotor activity monitored under conditions of cycling light and dark (12 h each per cycle). The elementary behavior of wild-type flies under these "LD" conditions fluctuated between levels of high and levels of low activity. Two high-activity peaks occurred within a given cycle: one at about dawn; the other, at around dusk. Such accentuated activity levels gradually subsided to troughs in the middle of the day and of the night, after which the flies anticipated the next environmental transition by gradually become more active. Descriptions of these activity profiles were augmented by newly developed formal analyses of the "diel rhythm" phases (based in part on **digital filterings** of the raw behavioral data). The applications of these analyses led to objective, automated determination of when in the morning and the evening the flies' activity peaks occur. This normal diel behavior was compared to the locomotor activity and phase determinations for a series of rhythm variants. Most of these involved mutations at the period (per) locus and germ-line transformants bearing normal or altered forms of **DNA** cloned from this "clock gene." Such genetic variants have been shown previously to exhibit, in constant darkness, strain-specific circadian periods ranging from about 19 to about 29 h. We now show that the phases of the evening peaks of activity under LD conditions were correspondingly earlier than normal for the short-period mutants and later than normal for those with long circadian cycle durations. The morning peaks, however, moved (in comparison to the normal phas position) minimally under the influence of a given per variant.
CC Genetics and Cytogenetics - Animal *03506
Behavioral Biology - Animal Behavior *07003
Circadian Rhythms and Other Periodic Cycles *07200
External Effects - Light and Darkness 10604
Movement 12100
Invertebrata, Comparative and Experimental Morphology, Physiology and Pathology - Insecta - Physiology *64076
BC Diptera 75314
IT Miscellaneous Descriptors
DROSOPHILA-MELANOGASTER LOCOMOTOR ACTIVITY CLOCK GENE PHASE ANALYSIS

L30 ANSWER 3 OF 16 BIOSIS COPYRIGHT 2000 BIOSIS
AN 1980:149234 BIOSIS
DN BA69:24230
TI COMPUTER CONTROLLED DOUBLE BEAM SCANNING MICRO SPECTROPHOTOMETRY FOR RAPID MICROSCOPIC IMAGE RECONSTRUCTIONS.
AU DUCERA P; DE RIBAUPIERRE Y; DE RIAUPIERR F
CS INST. PHYSIOL. UNIV., RUE DE BUGNON 7, CH-01 LAUSANNE, SWITZ.
SO J MICROSC (OXF), (1979) 116 (2), 173-184.
CODEN: JMICAR. ISSN: 0022-2720.
FS BA; OLD
LA English

AB A method for the automated collection of various specific data from an entire microscopic preparation and their quantitative evaluation is described. Its application to the study of neuronal connections is discussed in some detail. Brain sections are scanned using a computer-controlled microscope for reflectance, fluorescences or absorbance signals. Two illuminating beams are used, 1 being amplitude modulated. By synchronous detection the 2 signals are recorded simultaneosly: e.g., in an autoradiograph, the reflectance (measuring the density of the Ag grains in the emulsion) and the absorbance (allowing to localize the underlying counterstained cells). The data are stored in a computer. Various off-line processing schemes allow the reconstruction of the data with respect to the corresponding spatial coordinates. Pseudo-3-dimensional, analog or digital, graphic displays may be obtained in which the patterns of neuronal connections can be recognized and interpreted. A method for the detection of weakly labeled nerve fibers based on **digital filtering** is presented. The whole processing for a frontal section of the mouse brain (7 .times. 10 nm area) takes less than 1 h. In addition to the evaluation of microscopically labelled material (grains of autoradographs, horseradish peroxidase, **nucleic acids**) the technique was successfully used for the study of naturally fluorescent intracellular components in living tissue cultures.

CC General Biology - Information, Documentation, Retrieval and Computer Applications *00530
Methods, Materials and Apparatus, General - Photography *01012
Microscopy Techniques - General and Special Techniques *01052
Microscopy Techniques - Cytology and Cytochemistry 01054
Cytology and Cytochemistry - Animal 02506
Mathematical Biology and Statistical Methods 04500
Radiation - Radiation and Isotope Techniques 06504
Biochemical Studies - Nucleic Acids, Purines and Pyrimidines 10062
Biochemical Studies - Proteins, Peptides and Amino Acids 10064
Biochemical Studies - Porphyrins and Bile Pigments 10065
Biochemical Studies - Minerals 10069
Biophysics - General Biophysical Techniques 10504
Biophysics - Biocybernetics 10515
Enzymes - Methods 10804
Enzymes - Physiological Studies 10808
Anatomy and Histology, General and Comparative - Microscopic and Ultramicroscopic Anatomy *11108
Nervous System - General; Methods 20501
Nervous System - Physiology and Biochemistry 20504
Tissue Culture, Apparatus, Methods and Media 32500
Plant Physiology, Biochemistry and Biophysics - Enzymes 51518

BC Cruciferae 25880
Muridae 86375

IT Miscellaneous Descriptors
MOUSE BRAIN AUTO RADIOGRAPHY REFLECTANCE ABSORBANCE FLUORESCENCE TISSUE CULTURE HORSERADISH PEROXIDASE

RN 9003-99-0 (PEROXIDASE)

L30 ANSWER 4 OF 16 MEDLINE

AN 93092792 MEDLINE

DN 93092792

TI Quantification of fluorescence in situ hybridization signals by image cytometry.

AU Nederlof P M; van der Flier S; Verwoerd N P; Vrolijk J; Raap A K; Tanke H J

CS Sylvius Laboratory, Department of Cytochemistry and Cytometry, University of Leiden, The Netherlands..

SO CYTOMETRY, (1992) 13 (8) 846-52.
Journal code: D92. ISSN: 0196-4763.

CY United States

DT Journal; Article; (JOURNAL ARTICLE)

LA English
FS Priority Journals
EM 199303
AB In this study we aimed at the development of a cytometric system for quantification of specific **DNA** sequences using fluorescence in situ hybridization (ISH) and digital imaging microscopy. The cytochemical and cytometric aspects of a quantitative ISH procedure were investigated, using human peripheral blood lymphocyte interphase nuclei and probes detecting high copy number target sequences as a model system. These chromosome-specific probes were labeled with biotin, digoxigenin, or fluorescein. The instrumentation requirements are evaluated. Quantification of the fluorescence ISH signals was performed using an epi-fluorescence microscope with a multi-wavelength illuminator, equipped with a cooled charge couple device (CCD) camera. The performance of the system was evaluated using fluorescing beads and a homogeneously fluorescing specimen. Specific image analysis programs were developed for the automated segmentation and analysis of the images provided by ISH. Non-uniform background fluorescence of the nuclei introduces problems in the image analysis segmentation procedures. Different procedures were tested. Up to 95% of the hybridization signals could be correctly segmented using **digital filtering** techniques (min-max filter) to estimate local background intensities. The choice of the objective lens used for the collection of images was found to be extremely important. High magnification objectives with high numerical aperture, which are frequently used for visualization of fluorescence, are not optimal, since they do not have a sufficient depth of field. The system described was used for quantification of ISH signals and allowed accurate measurement of fluorescence spot intensities, as well as of fluorescence ratios obtained with double-labeled probes.
CT Check Tags: Human; Support, Non-U.S. Gov't
Analog-Digital Conversion
*Cell Nucleus: UL, ultrastructure
Chromosomes, Human, Pair 1
Chromosomes, Human, Pair 7
***DNA: AN, analysis**
DNA Probes
DNA, Satellite: AN, analysis
Image Processing, Computer-Assisted: IS, instrumentation
*Image Processing, Computer-Assisted: MT, methods
In Situ Hybridization, Fluorescence: IS, instrumentation
*In Situ Hybridization, Fluorescence: MT, methods
Interphase
*Lymphocytes: UL, ultrastructure
Microscopy, Fluorescence: IS, instrumentation
Photomicrography: IS, instrumentation
RN **9007-49-2 (DNA)**
CN 0 (**DNA** Probes); 0 (**DNA**, Satellite)

L30 ANSWER 5 OF 16 MEDLINE
AN 81096628 MEDLINE
DN 81096628
TI Computer-controlled double-beam scanning microspectrophotometry for rapid microscopic image reconstructions.
AU Kucera P; de Ribaupierre Y; de Ribaupierre F
SO JOURNAL OF MICROSCOPY, (1979 Jul) 116 (2) 173-84.
Journal code: J5V. ISSN: 0022-2720.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 198105
AB A method for automated collection of various specific data from an entire microscopical preparation and their quantitative evaluation is described. Its application to the study of neuronal connections is discussed in some

detail. Brain sections are scanned using a computer-controlled microscope for reflectance, fluorescences or absorbance signals. Two illuminating beams are used, one of them being amplitude modulated. By means of a synchronous detection the two signals are recorded simultaneously: for example, in an autoradiograph, the reflectance (measuring the density of the silver grains in emulsion) and the absorbance (allowing to localize the underlying counterstained cells). The data are stored in a computer. Various off-line processing schemes allow the reconstruction of the data with respect to the corresponding spatial coordinates. Thus pseudo-three-dimensional, analogue or digital, graphic displays may be obtained in which the patterns of neuronal connections can be recognized and interpreted. A method for the detection of weakly labelled nerve fibres based on **digital filtering** is presented. The whole processing for a frontal section of the mouse brain (7 X 10 mm area) takes less than 1 h. In addition to the evaluation of microscopically labelled material (grains of autoradiographs, horseradish peroxidase, **nucleic acids**) the technique described has been successfully used for the study of naturally fluorescent intracellular components in living tissue cultures.

CT Check Tags: Animal; Support, Non-U.S. Gov't
Autoradiography
Brain: CY, cytology
Chick Embryo
Computers
Mice
*Microscopy: MT, methods
*Neural Pathways
Neurons: CY, cytology
*Spectrophotometry
Staining

L30 ANSWER 6 OF 16 CAPLUS COPYRIGHT 2000 ACS
AN 1999:365091 CAPLUS
DN 131:196538
TI Analysis of ultrasensitive fluorescence experiments
AU Sun, Yuxing; Whitehead, Bruce A.; Davis, Lloyd M.
CS Center for Laser Applications, Univ. of Tennessee Space Institute, Tullahoma, TN, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3602(Advances in Fluorescence Sensing Technology IV), 379-390
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 9-5 (Biochemical Methods)
Section cross-reference(s): 3
AB **DNA** sequencing and several other applications of single- mol. detection (SMD) currently under development utilize spectroscopic measurements for categorization of different types of fluorophores. In the collection and anal. of data from such expts., the photon signals are sorted into different channels, depending upon their arrival time, emission wavelength, or other distinguishable properties. If the photon statistics are adequate, max.-likelihood estn. (MLE) techniques can be successfully applied to det. which fluorophore is present. However, data anal. using neural network (NN) methods can offer several advantages. We consider data from a Monte Carlo simulation of SMD in a flow-cell, in which a time-resolved fluorescence decay profile is accumulated for each photon burst. A 2-layer NN, with sigmoid as the activation function, is trained on a set of simulated data using back-propagation and the (delta) - learning rule, and then used for identification of photon bursts in subsequent simulations. The NN is able to consider addnl. input parameters, such as the amplitudes of the weighted-sliding-sum **digital-filter** output of the photon bursts and the durations of the bursts. It can yield superior identification of photon

bursts, particularly in cases where the fluorophores have disparate fluorescence quantum efficiencies, absorption cross sections, or photodegrdn. efficiencies, or where the categorization includes other possibilities, such as background fluctuations, or the simultaneous presence of both fluorophores.

ST neural network fluorescence single mol detection **DNA** sequencing

IT Fluorometry
(max.-likelihood estn. and neural network methods for anal. of fluorescence single- mol. detection)

IT **DNA** sequence analysis
Mathematical methods
(max.-likelihood estn. and neural network methods for anal. of fluorescence single- mol. detection in)

IT Simulation and Modeling, physicochemical
(neural network; max.-likelihood estn. and neural network methods for anal. of fluorescence single- mol. detection in)

RE.CNT 22

RE

(1) Bunfield, D; Appl Opt 1995, V34, P3208
(2) Bunfield, D; Thesis University of Tennessee 1997
(3) Davis, L; BiOS Europe Conference 1998, P282
(4) Davis, L; Biomedical Sensors Fibers and Optical Delivery Systems 1999
(5) Davis, L; Book of Abstracts
(6) Davis, L; SPIE Proceedings V3570
(7) Davis, L; The Fifth International Conference on Methods and Applications of Fluorescence Spectroscopy 1997, P27
(8) Dorre, K; Bioimaging 1997, V5, P139 CAPLUS
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(12) Krose, B; An Introduction to Neural networks 8th ed 1996
(13) Li, L; Appl Opt 1993, V32, P806
(14) Lieberwirth, U; Anal Chem 1998, V70, P4771 CAPLUS
(15) Sauer, M; Applied Fluorescence in Chemistry Biology and Medicine 1999
(16) Sauer, M; Bioimaging 1998, V6, P14 CAPLUS
(17) Soper, S; J Opt Soc Am B 1992, V9, P1761 CAPLUS
(18) Soper, S; Photochem and Photobiol 1993, V57, P972 CAPLUS
(19) Werner, J; Advances in Fluorescence Sensing Technology 1999, V4
(20) Werner, J; BiOS Conference 1999
(21) Werner, J; paper 40 in SPIE Proceedings V3602
(22) Zander, C; Appl Phys B 1996, V63, P517

L30 ANSWER 7 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1999:228827 CAPLUS
DN 131:69253

TI Computer simulation of gene detection without PCR by single molecule detection

AU Davis, Lloyd M.; Williams, John G. K.; Lamb, Don T.
CS Center for Laser Applications, University of Tennessee Space Institute, Tullahoma, TN, 37388, USA

SO Proc. SPIE-Int. Soc. Opt. Eng. (1999), 3570(Biomedical Sensors, Fibers, and Optical Delivery Systems), 282-293
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 3-6 (Biochemical Genetics)
Section cross-reference(s): 9

AB Pioneer Hi-Bred is developing a low-cost method for rapid screening of **DNA**, for use in research on elite crop seed genetics. Unamplified genomic **DNA** with the requisite base sequence is simultaneously labeled by two different colored fluorescent probes, which hybridize near the selected gene. Dual-channel single mol. detection (SMD) within a flow

cell then provides a sensitive and specific assay for the gene. The technique has been demonstrated using frequency-doubled Nd:YAG laser excitation of two visible-wavelength dyes. A prototype instrument employing IR fluorophores and laser diodes for excitation has been developed. Here, we report results from a Monte Carlo simulation of the new instrument, in which exptl. detd. photophys. parameters for candidate IR dyes are used for parametric studies of exptl. operating conditions. Our findings demonstrate the feasibility of the approach for selected fluorophores, and identify suitable operating conditions. Fluorophore photostability is found to be a key factor in detg. the instrument sensitivity. Most IR dyes have poor photostability, resulting in inefficient SMD. However, the normalized cross-correlation function of the photon signals from each of the two channels can still yield a discernable peak, provided that the concn. of dual-labeled mols. is sufficiently high. Further, for low concns., processing of the two photon streams with Gaussian weighted sliding sum **digital filters** and selection of simultaneously occurring peaks can also provide a sensitive indicator of the presence of dual-labeled mols., although accidental coincidences must be considered in the interpretation of results.

ST computer simulation gene screening single mol detection

IT **Nucleic acid** hybridization
(**DNA-DNA**; computer simulation of gene detection without PCR by single mol. detection)

IT Dyes
(IR; computer simulation of gene detection without PCR by single mol. detection)

IT Simulation and Modeling, physicochemical
(Monte Carlo; computer simulation of gene detection without PCR by single mol. detection)

IT Fluorescence
Molecules
(computer simulation of gene detection without PCR by single mol. detection)

IT Gene
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(detection of; computer simulation of gene detection without PCR by single mol. detection)

IT Genetic methods
(dual-channel single mol. detection (SMD); computer simulation of gene detection without PCR by single mol. detection)

IT Fluorescent substances
(photostability of, key factor in detg. the instrument sensitivity; computer simulation of gene detection without PCR by single mol. detection)

IT Probes (**nucleic acid**)
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(two different colored fluorescent; computer simulation of gene detection without PCR by single mol. detection)

IT Fluorescent dyes
(two probes labeled with different; computer simulation of gene detection without PCR by single mol. detection)

IT **DNA**
RL: ANT (Analyte); BSU (Biological study, unclassified); ANST (Analytical study); BIOL (Biological study)
(unamplified genomic, gene detection in; computer simulation of gene detection without PCR by single mol. detection)

RE.CNT 5

RE

(1) Bunfield, D; Appl Opt 1998, V37, P2315 CAPLUS
(2) Castro, A; Anal Chem 1997, V69, P3915 CAPLUS
(3) Loudon, R; The Quantum Theory of Light 1st ed 1973, P210
(4) Lundgren, T; J Basic Eng 1964, V86, P620
(5) Soper, S; Photochem and Photobiol 1993, V57, P972 CAPLUS

L30 ANSWER 8 OF 16 CAPLUS COPYRIGHT 2000 ACS
AN 1996:304534 CAPLUS
DN 125:29407
TI Single molecule fluorescence burst detection of **DNA** separated by capillary electrophoresis
AU Haab, Brian B.; Mathies, Richard A.
CS Department of Chemistry, University of California, Berkeley, CA, 94720, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1996), 2705(Fluorescence Detection IV), 162-169
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 9-5 (Biochemical Methods)
AB A method has been developed for detecting **DNA** sepd. by capillary gel electrophoresis using single mol. photon burst counting. A confocal fluorescence microscope was used to observe the fluorescence bursts from single mols. of **DNA** multiply labeled with a thiazole orange deriv. as they passed through the .apprx.2 .mu.m diam. focused laser beam.
Amplified photoelectron pulses from the photomultiplier are grouped into bins of from 360-450 .mu.s in duration, and the resulting histogram stored in a computer for anal. Solns. of M13 **DNA** were first flowed through the capillary at various concns., and the resulting data were used to optimize the parameters for **digital filtering** using a low-pass Fourier filter, selecting a discriminator level for peak detection, and applying a peak-calling algorithm. The optimized single mol. counting method was then used to detect a sepn. of pBR 322 **DNA** from pRL 277 **DNA**. Clusters of discrete fluorescence bursts were obsd. at the expected appearance time of each **DNA** band. These sepns. were easily detected when only 50 to 100 mols. of **DNA** per band traveled through the detection region. This new detection technol. should lead to the routine anal. of **DNA** in capillary columns with an on-column sensitivity of .apprx. 100 **DNA** mols. per band or better.
ST **DNA** detection single mol fluorescence burst
IT Photon
(single mol. fluorescence burst detection of **DNA** sepd. by capillary electrophoresis)
IT Deoxyribonucleic acids
RL: ANT (Analyte); ANST (Analytical study)
(single mol. fluorescence burst detection of **DNA** sepd. by capillary electrophoresis)

L30 ANSWER 9 OF 16 CAPLUS COPYRIGHT 2000 ACS
AN 1995:800379 CAPLUS
DN 123:247800
TI Single molecule fluorescence burst detection of **DNA** fragments separated by capillary electrophoresis
AU Haab, Brian B.; Mathies, Richard A.
CS Department of Chemistry, University of California, Berkeley, CA, 94720, USA
SO Anal. Chem. (1995), 67(18), 3253-60
CODEN: ANCHAM; ISSN: 0003-2700
DT Journal
LA English
CC 3-1 (Biochemical Genetics)
Section cross-reference(s): 9
AB A method has been developed for detecting **DNA** sepd. by capillary gel electrophoresis (CGE) using single mol. photon burst counting. A confocal fluorescence microscope was used to observe the fluorescence bursts from single mols. of **DNA** multiply labeled with the

thiazole orange deriv. TO6 as they passed through the .apprx.2-.mu.m diam. focused laser beam. Amplified photoelectron pulses from the photomultiplier are grouped into bins of 360-450 .mu.s in duration, and the resulting histogram is stored in a computer for anal. Solns. of M13 **DNA** were first flowed through the capillary at various concns., and the resulting data were used to optimize the parameters for **digital filtering** using a low-pass Fourier filter, selecting a discriminator level for peak detection, and applying a peak-calling algorithm. Statistical analyses showed that (i) the no. of M13 mols. counted vs. concn. was linear with slope = 1, (ii) the av. burst duration was consistent with the expected transit time of a single mol. through the laser beam, and (iii) the no. of detected mols. was consistent with single mol. detection. The optimized single mol. counting method was then applied to an electrophoretic sepn. of M13 **DNA** and to a sepn. of pBR322 **DNA** from pRL277 **DNA**. Clusters of discreet fluorescence bursts were obsd. at the expected appearance time of each **DNA** band. The autocorrelation function of these data indicated transit times that were consistent with the obsd. electrophoretic velocity. These sepns. were easily detected when only 50-100 mols. of **DNA** per band traveled through the detection region. This new detection technol. should lead to the routine anal. of **DNA** in capillary columns with an on-column sensitivity of .apprx.100 **DNA** mols./band or better.

ST **DNA** capillary electrophoresis single mol fluorescence

IT Lasers
(a confocal fluorescence microscope was used to observe the fluorescence bursts from single mols. of **DNA** multiply labeled with the thiazole orange deriv. TO6 as they passed through the .apprx.2-.mu.m diam. focused laser beam)

IT Photon
(a method has been developed for detecting **DNA** sepd. by capillary gel electrophoresis using single mol. photon burst counting)

IT Plasmid and Episome
(pRL277; the optimized single mol. fluorescence burst detection of **DNA** fragments sepd. by capillary electrophoresis was then applied to an electrophoretic sepn. of M13 **DNA** and to a sepn. of pBR322 **DNA** from pRL277 **DNA**)

IT Fluorescence
(single mol. fluorescence burst detection of **DNA** fragments sepd. by capillary electrophoresis)

IT Deoxyribonucleic acids
RL: ANT (Analyte); ANST (Analytical study)
(the optimized single mol. fluorescence burst detection of **DNA** fragments sepd. by capillary electrophoresis was then applied to an electrophoretic sepn. of M13 **DNA** and to a sepn. of pBR322 **DNA** from pRL277 **DNA**)

IT Virus, bacterial
(M13, the optimized single mol. fluorescence burst detection of **DNA** fragments sepd. by capillary electrophoresis was then applied to an electrophoretic sepn. of M13 **DNA** and to a sepn. of pBR322 **DNA** from pRL277 **DNA**)

IT Electrophoresis and Ionophoresis
(gel, capillary, single mol. fluorescence burst detection of **DNA** fragments sepd. by capillary electrophoresis)

IT Plasmid and Episome
(pBR322, the optimized single mol. fluorescence burst detection of **DNA** fragments sepd. by capillary electrophoresis was then applied to an electrophoretic sepn. of M13 **DNA** and to a sepn. of pBR322 **DNA** from pRL277 **DNA**)

IT 153087-66-2, TO 6

RL: BAC (Biological activity or effector, except adverse); BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(a confocal fluorescence microscope was used to observe the fluorescence bursts from single mols. of **DNA** multiply labeled with the thiazole orange deriv. TO6 as they passed through the .apprx.2-.mu.m diam. focused laser beam)

L30 ANSWER 10 OF 16 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.
AN 1998166655 EMBASE
TI Visualization of single **RNA** transcripts in situ.
AU Femino A.M.; Fay F.S.; Fogarty K.; Singer R.H.
CS R.H. Singer, Department of Anatomy, Albert Einstein College of Medicine, Bronx, NY 10461, United States
SO Science, (24 Apr 1998) 280/5363 (585-590).
Refs: 24
ISSN: 0036-8075 CODEN: SCIEAS
CY United States
DT Journal; Article
FS 029 Clinical Biochemistry
LA English
SL English
AB Fluorescence in situ hybridization (FISH) and digital imaging microscopy were modified to allow detection of single **RNA** molecules. Oligodeoxynucleotide probes were synthesized with five fluorochromes per molecule, and the light emitted by a single probe was calibrated. Points of light in exhaustively deconvolved images of hybridized cells gave fluorescent intensities and distances between probes consistent with single messenger **RNA** molecules. Analysis of .beta.-actin transcription sites after serum induction revealed synchronous and cyclical transcription from single genes. The rates of transcription initiation and termination and messenger **RNA** processing could be determined by positioning probes along the transcription unit. This approach extends the power of FISH to yield quantitative molecular information on a single cell.
CT Medical Descriptors:
***rna analysis**
***rna processing**
fluorescence in situ hybridization
digital filtering
infrared radiation
transcription regulation
binding site
dna probe
article
priority journal
Drug Descriptors:
***messenger rna: EC, endogenous compound**
*beta actin: EC, endogenous compound

L30 ANSWER 11 OF 16 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.
AN 92338287 EMBASE
DN 1992338287
TI Quantification of fluorescence in situ hybridization signals by image cytometry.
AU Nederlof P.M.; Van der Flier S.; Verwoerd N.P.; Vrolijk J.; Raap A.K.; Tanke H.J.
CS Sylvius Laboratory, Dept. of Cytochemistry/Cytometry, University of Leiden, Wassenaarseweg 72,2333 AL Leiden, Netherlands
SO Cytometry, (1992) 13/8 (846-852).
ISSN: 0196-4763 CODEN: CYTODQ
CY United States
DT Journal; Article
FS 022 Human Genetics
025 Hematology

026 Immunology, Serology and Transplantation
027 Biophysics, Bioengineering and Medical Instrumentation
LA English
SL English
AB In this study we aimed at the development of a cytometric system for quantification of specific **DNA** sequences using fluorescence in situ hybridization (ISH) and digital imaging microscopy. The cytochemical and cytometric aspects of a quantitative ISH procedure were investigated, using human peripheral blood lymphocyte interphase nuclei and probes detecting high copy number target sequences as a model system. These chromosome-specific probes were labeled with biotin, digoxigenin, or fluorescein. The instrumentation requirements are evaluated. Quantification of the fluorescence ISH signals was performed using an epi-fluorescence microscope with a multi-wave-length illuminator, equipped with a cooled charge couple device (CCD) camera. The performance of the system was evaluated using fluorescing beads and a homogeneously fluorescing specimen. Specific image analysis programs were developed for the automated segmentation and analysis of the images provided by ISH. Non-uniform background fluorescence of the nuclei introduces problems in the image analysis segmentation procedures. Different procedures were tested. Up to 95% of the hybridization signals could be correctly segmented using **digital filtering** techniques (min-max filter) to estimate local background intensities. The choice of the objective lens used for the collection of images was found to be extremely important. High magnification objectives with high numerical aperture, which are frequently used for visualization of fluorescence, are not optimal since they do not have a sufficient depth of field. The system described was used for quantification of ISH signals and allowed accurate measurement of fluorescence spot intensities, as well as fluorescence ratios obtained with double-labeled probes.
CT Medical Descriptors:
***dna sequence**
*fluorescence
*in situ hybridization
*quantitative assay
adult
article
chromosome 1
human
human cell
image analysis
normal human
priority journal
***dna probe**

L30 ANSWER 12 OF 16 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.
AN 79258416 EMBASE
DN 1979258416
TI Computer-controlled double-beam scanning microspectrophotometry for rapid microscopic image reconstructions.
AU Kucera P.; De Ribaupierre Y.; De Ribaupierre F.
CS Inst. Physiol. Univ., CH-1011 Lausanne, Switzerland
SO Journal of Microscopy, (1979) 116/2 (173-184).
CODEN: JMICAR
CY United Kingdom
DT Journal
FS 001 Anatomy, Anthropology, Embryology and Histology
027 Biophysics, Bioengineering and Medical Instrumentation
LA English
AB A method for automated collection of various specific data from an entire microscopical preparation and their quantitative evaluation is described. Its application to the study of neuronal connections is discussed in some detail. Brain sections are scanned using a computer-controlled microscope

for reflectance, fluorescences or absorbance signals. Two illuminating beams are used, one of them being amplitude modulated. By means of a synchronous detection the two signals are recorded simultaneously: for example, in an autoradiograph, the reflectance (measuring the density of the silver grains in the emulsion) and the absorbance (allowing to localize the underlying counterstained cells). The data are stored in a computer. Various off-line processing schemes allow the reconstruction of the data with respect to the corresponding spatial coordinates. Thus pseudo-three-dimensional, analogue or digital, graphic displays may be obtained in which the patterns of neuronal connections can be recognized and interpreted. A method for the detection of weakly labelled nerve fibres based on **digital filtering** is presented. The whole processing for a frontal section of the mouse brain (7 x 10 mm area) takes less than 1 hr. In addition to the evaluation of microscopically labelled material (grains of autoradiographs, horseradish peroxidase, **nucleic acids**) the technique described has been successfully used for the study of naturally fluorescent intracellular components in living tissue cultures.

CT Medical Descriptors:
*image
*microscopy
*microspectrophotometry
methodology
electron microscopy
computer analysis

L30 ANSWER 13 OF 16 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 2000:100010 SCISEARCH
GA The Genuine Article (R) Number: 279KM
TI Digitally filtered molecular dynamics: The frequency specific control of molecular dynamics simulations
AU Phillips S C; Essex J W (Reprint); Edge C M
CS UNIV SOUTHAMPTON, DEPT CHEM, SOUTHAMPTON SO17 1BJ, HANTS, ENGLAND (Reprint); UNIV SOUTHAMPTON, DEPT CHEM, SOUTHAMPTON SO17 1BJ, HANTS, ENGLAND; SMITHKLINE BEECHAM PHARMACEUT, HARLOW CM19 5AD, ESSEX, ENGLAND
CYA ENGLAND
SO JOURNAL OF CHEMICAL PHYSICS, (8 FEB 2000) Vol. 112, No. 6, pp. 2586-2597.
Publisher: AMER INST PHYSICS, CIRCULATION FULFILLMENT DIV, 500 SUNNYSIDE BLVD, WOODBURY, NY 11797-2999.
ISSN: 0021-9606.
DT Article; Journal
FS PHYS
LA English
REC Reference Count: 28
AB A new method for modifying the course of a molecular dynamics computer simulation is presented. Digitally filtered molecular dynamics (DFMD) applies the well-established theory of **digital filters** to molecular dynamics simulations, enabling atomic motion to be enhanced or suppressed in a selective manner solely on the basis of frequency. The basic theory of **digital filters** and its application to molecular dynamics simulations is presented, together with the application of DFMD to the simple systems of single molecules of water and butane. The extension of the basic theory to the condensed phase is then described followed by its application to liquid phase butane and the Syrian hamster prion protein. The high degree of selectivity and control offered by DFMD, and its ability to enhance the rate of conformational change in butane and in the prion protein, is demonstrated. (C) 2000 American Institute of Physics. [S0021-9606(00)52805-0].
CC PHYSICS, ATOMIC, MOLECULAR & CHEMICAL

STP KeyWords Plus (R): POTENTIAL FUNCTIONS; **NUCLEIC-ACIDS**; FORCE-FIELD; PROTEINS; TRAJECTORIES; ECHOES; MOTION; WATER

RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
ASKAR A	1996	100	19165	J PHYS CHEM-US
BECKER O M	1993	70	3514	PHYS REV LETT
CASE D A	1997			AMBER 5
CORNELL W D	1995	117	5179	J AM CHEM SOC
DARDEN T	1993	98	10089	J CHEM PHYS
DAUBEROSGUTHORPE P	1990	112	7921	J AM CHEM SOC
DAUBEROSGUTHORPE P	1996	10	177	J COMPUT AID MOL DES
GOLDFARB L G	1992	258	806	SCIENCE
GREST G S	1980	36	875	SOLID STATE COMMUN
HUBER T	1998	102	5937	J PHYS CHEM A
JORGENSEN W L	1995			BOSS VERSION 3 6
JORGENSEN W L	1984	106	6638	J AM CHEM SOC
JORGENSEN W L	1983	79	926	J CHEM PHYS
LEVITT M	1991	220	1	J MOL BIOL
LU H	1998	75	662	BIOPHYS J
OSGUTHORPE D J	1992	10	178	J MOL GRAPHICS
PAN K M	1993	90	10962	P NATL ACAD SCI USA
PARCHMENT O G				IN PRESS PROTEINS ST
PRESS W H	1992			NUMERICAL RECIPES C
RYCKAERT J P	1977	23	327	J COMPUT PHYS
SAFAR J	1993	2	2206	PROTEIN SCI
SESSIONS R B	1989	210	617	J MOL BIOL
SESSIONS R B	1995	99	9034	J PHYS CHEM-US
SMITH W	1996	14	136	J MOL GRAPHICS
TELEMAN O	1987	60	193	MOL PHYS
WEINER S J	1984	106	765	J AM CHEM SOC
WILLIAMS C S	1986			DESIGNING DIGITAL FI
XU D	1995	103	3124	J CHEM PHYS

L30 ANSWER 14 OF 16 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 95:622280 SCISEARCH
GA The Genuine Article (R) Number: RU331
TI SINGLE-MOLECULE FLUORESCENCE BURST DETECTION OF **DNA** FRAGMENTS SEPARATED CAPILLARY ELECTROPHORESIS
AU HAAB B B; MATHIES R A (Reprint)
CS UNIV CALIF BERKELEY, DEPT CHEM, BERKELEY, CA, 94720 (Reprint); UNIV CALIF BERKELEY, DEPT CHEM, BERKELEY, CA, 94720
CYA USA
SO ANALYTICAL CHEMISTRY, (15 SEP 1995) Vol. 67, No. 18, pp. 3253-3260. ISSN: 0003-2700.
DT Article; Journal
FS PHYS; LIFE
LA ENGLISH
REC Reference Count: 44
AB A method has been developed for detecting **DNA** separated by capillary gel electrophoresis (CGE) using single molecule photon burst counting, A confocal fluorescence microscope was used to observe the fluorescence bursts from single molecules of **DNA** multiply labeled with the thiazole orange derivative TO6 as they passed through the similar to 2-mu m diameter focused laser beam. Amplified photoelectron pulses from the photomultiplier are grouped into bins of 360-450 mu s in duration, and the resulting histogram is stored in a computer for analysis, Solutions of M13 **DNA** were first flowed through the capillary at various concentrations, and the resulting data were used to optimize the parameters for **digital filtering** using a lowpass Fourier filter, selecting a discriminator level for peak detection, and applying a peak-calling algorithm, Statistical analyses showed that (i) the number of M13 molecules counted versus concentration

was linear with slope = 1, (ii) the average burst duration was consistent with the expected transit time of a single molecule through the laser beam, and (iii) the number of detected molecules was consistent with single molecule detection. The optimized single molecule counting method was then applied to an electrophoretic separation of M13 **DNA** and to a separation of pBR 322 **DNA** from pRL 277 **DNA**.
Clusters of discreet fluorescence bursts were observed at the expected appearance time of each **DNA** band, The autocorrelation function of these data indicated transit times that were consistent with the observed electrophoretic velocity. These separations were easily detected when only 50-100 molecules of **DNA** per band traveled through the detection region. This new detection technology should lead to the routine
analysis of **DNA** in capillary columns with an on-column sensitivity of similar to 100 **DNA** molecules/band or better.
CC CHEMISTRY, ANALYTICAL
STP KeyWords Plus (R): LASER-INDUCED FLUORESCENCE; GEL-ELECTROPHORESIS; SPECTROSCOPY; PHYCOERYTHRIN; EXCITATION; MICROSCOPY; SIZE
RF 93-0744 003; PERSISTENT SPECTRAL HOLE-BURNING; SINGLE MOLECULES; HIGH-RESOLUTION SPECTROSCOPY; OPTICALLY DRIVEN QUANTUM NETWORKS; DISPERSED
FLUORESCENCE
93-2117 002; CAPILLARY ELECTROPHORESIS; SIMULTANEOUS CHIRAL SEPARATION; SELECTIVITY MANIPULATION IN MICELLAR ELECTROKINETIC CHROMATOGRAPHY
93-3721 002; PULSED-FIELD GEL-ELECTROPHORESIS; DNA DOUBLE-STRAND BREAKS; YEAST CHROMOSOMES
RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
AMBROSE W P	1991	95	7150	J CHEM PHYS
AMBROSE W P	1994	265	364	SCIENCE
BASCHE T	1992	355	335	NATURE
BENSON S C	1993	21	5720	NUCLEIC ACIDS RES
BENSON S C	1993	21	5727	NUCLEIC ACIDS RES
BETZIG E	1993	262	1422	SCIENCE
BLACK T A	1993	9	77	MOL MICROBIOL
CASTRO A	1993	65	849	ANAL CHEM
CLARK S M	1993	215	163	ANAL BIOCHEM
EWING A G	1989	61	A 292	ANAL CHEM
GLAZER A N	1990	87	3851	P NATL ACAD SCI USA
GOODWIN P M	1993	21	803	NUCLEIC ACIDS RES
HELL S	1993	169	391	J MICROSC-OXFORD
HIRSCHFELD T	1976	15	2965	APPL OPTICS
HJERTEN S	1985	347	191	J CHROMATOGR
INGLE J D	1988		CH 5	SPECTROCHEMICAL ANAL
ISHIKAWA M	1994	33	1571	JPN J APPL PHYS PT 1
LANDERS J P	1993	14	98	BIOTECHNIQUES
LEE Y H	1994	66	4142	ANAL CHEM
MATHIES R A	1990	62	1786	ANAL CHEM
METS U	1994	4	259	J FLUORESC
MOERNER W E	1989	62	2535	PHYS REV LETT
MOERNER W E	1994	265	46	SCIENCE
NGUYEN D C	1987	59	2158	ANAL CHEM
NIE S M	1994	266	1018	SCIENCE
ORRIT M	1994	60	991	J LUMIN
PECK K	1989	86	4087	P NATL ACAD SCI USA
PERKINS T T	1994	264	819	SCIENCE
PETERSEN N O	1986	49	809	BIOPHYS J
PRESS W H	1992		CH 12	NUMERICAL RECIPES C
SCHAFER D A	1992	352	444	NATURE
SCHWARTZ D C	1989	338	520	NATURE
SHERA E B	1990	174	553	CHEM PHYS LETT
SMITH S B	1989	243	203	SCIENCE
SMITH S B	1992	258	1122	SCIENCE

SOPER S A	1991	63	432	ANAL CHEM
SOPER S A	1992	9	1761	J OPT SOC AM
TRAUTMAN J K	1994	369	40	NATURE
WHITTEN W B	1991	63	1027	ANAL CHEM
WILKERSON C W	1993	62	2030	APPL PHYS LETT
WILSON T	1987	12	227	OPT LETT
WOOLLEY A T	1994	91	11348	P NATL ACAD SCI USA
XIE X S	1994	265	361	SCIENCE
ZHU H P	1994	66	1941	ANAL CHEM

L30 ANSWER 15 OF 16 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 92:641565 SCISEARCH
GA The Genuine Article (R) Number: JV644
TI QUANTIFICATION OF FLUORESCENCE INSITU HYBRIDIZATION SIGNALS BY IMAGE CYTOMETRY
AU NEDERLOF P M; VANDERFLIER S; VERWOERD N P; VROLIJK J; RAAP A K (Reprint); TANKE H J
CS LEIDEN UNIV, DEPT CYTOCHEM & CYTOMETRY, SYLVIUS LAB, WASSENAARSEWEG 72, 2333 AL LEIDEN, NETHERLANDS
CYA NETHERLANDS
SO CYTOMETRY, (1992) Vol. 13, No. 8, pp. 846-852.
ISSN: 0196-4763.
DT Article; Journal
FS LIFE
LA ENGLISH
REC Reference Count: 23
AB In this study we aimed at the development of a cytometric system for quantification of specific **DNA** sequences using fluorescence in situ hybridization (ISH) and digital imaging microscopy. The cytochemical and cytometric aspects of a quantitative ISH procedure were investigated, using human peripheral blood lymphocyte interphase nuclei and probes detecting high copy number target sequences as a model system. These chromosome-specific probes were labeled with biotin, digoxigenin, or fluorescein. The instrumentation requirements are evaluated.

Quantification of the fluorescence ISH signals was performed using an epi-fluorescence microscope with a multi-wavelength illuminator, equipped with a cooled charge couple device (CCD) camera. The performance of the system was evaluated using fluorescing beads and a homogeneously fluorescing specimen.

Specific image analysis programs were developed for the automated segmentation and analysis of the images provided by ISH. Non-uniform background fluorescence of the nuclei introduces problems in the image analysis segmentation procedures. Different procedures were tested. Up to 95% of the hybridization signals could be correctly segmented using **digital filtering** techniques (min-max filter) to estimate local background intensities.

The choice of the objective lens used for the collection of images was found to be extremely important. High magnification objectives with high numerical aperture, which are frequently used for visualization of fluorescence, are not optimal, since they do not have a sufficient depth of field.

The system described was used for quantification of ISH signals and allowed accurate measurement of fluorescence spot intensities, as well as of fluorescence ratios obtained with double-labeled probes.
CC CYTOLOGY & HISTOLOGY; BIOMETHODS
ST Author Keywords: QUANTIFICATION; CCD CAMERA; IMAGE ANALYSIS; CHROMOSOME POLYMORPHISM
STP KeyWords Plus (R): STAGE ABSORBANCE CYTOPHOTOMETRY; OPTICAL ERRORS; MICROSCOPY; NUCLEI; GLARE
RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
AGARD D A	1989	30	353	METHOD CELL BIOL
AIKENS R S	1989	29	291	METHOD CELL BIOL

ARNDTJOVIN D J	1985	230	247	SCIENCE
BARROWS G H	1984	32	741	J HISTOCHEM CYTOCHEM
BAUMAN J	1989		275	FLOW CYTOGENETICS
BENSON D M	1985	100	1309	J CELL BIOL
DUIJNDAM W A L	1980	28	388	J HISTOCHEM CYTOCHEM
DUIJNDAM W A L	1980	28	395	J HISTOCHEM CYTOCHEM
FRANCON M	1961			PROGR MICROSCOPY
HIRAOKA Y	1987	238	36	SCIENCE
INOUE S	1986			VIDEO MICROSCOPY
JOHNSON G D	1982	55	231	J IMMUNOL METHODS
JOVIN T M	1989	18	271	ANNU REV BIOPHYS BIO
MAYALL B H	1970		171	INTRO QUANTITATIVE C
NEDERLOF P M	1992	13		CYTOMETRY
NEDERLOF P M	1992	13		CYTOMETRY
NUNEZ D J	1989	263	121	BIOCHEM J
RIDLER T W	1978	8	630	IEEE T SYST MAN CYB
SMITH L C	1986	129	857	METHOD ENZYMOL
TANKE H J	1980	28	1007	J HISTOCHEM CYTOCHEM
TRASK B	1988	78	251	HUM GENET
VANDEKKEN H	1990	11	153	CYTOMETRY
VERBEEK P W	1988	15	249	SIGNAL PROCESS

L30 ANSWER 16 OF 16 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 92:500902 SCISEARCH
GA The Genuine Article (R) Number: JJ759
TI BEHAVIOR OF PERIOD-ALTERED CIRCADIAN-RHYTHM MUTANTS OF DROSOPHILA IN LIGHT
- DARK CYCLES (DIPTERA, DROSOPHILIDAE)
AU HAMBLENCOYLE M J; WHEELER D A; RUTILA J E; ROSBASH M; HALL J C (Reprint)
CS BRANDEIS UNIV, DEPT BIOL, 235 BASSINE BLDG, WALTHAM, MA, 02254
CYA USA
SO JOURNAL OF INSECT BEHAVIOR, (JUL 1992) Vol. 5, No. 4, pp. 417-446.
ISSN: 0892-7553.
DT Article; Journal
FS AGRI
LA ENGLISH
REC No References
Keyed
AB Adults of Drosophila melanogaster had their locomotor activity monitored under conditions of cycling light and dark (12 h each per cycle). The elementary behavior of wild-type flies under these "LD" conditions fluctuated between levels of high and levels of low activity. Two high-activity peaks occurred within a given cycle: one at about dawn; the other, at around dusk. Such accentuated activity levels gradually subsided to troughs in the middle of the day and of the night, after which the flies anticipated the next environmental transition by gradually becoming more active. Descriptions of these activity profiles were augmented by newly developed formal analyses of the "diel rhythm " phases (based in part on **digital filterings** of the raw behavioral data). The applications of these analyses led to objective, automated determination of when in the morning and the evening the flies' activity peaks occur. This normal diel behavior was compared to the locomotor activity and phase determinations for a series of rhythm variants. Most of these involved mutations at the period (per) locus and germ-line transformants bearing normal or altered forms of **DNA** cloned from this "clock gene." Such genetic variants have been shown previously to exhibit, in constant darkness, strain-specific circadian periods ranging from about 19 to about 29 h. We now show that the phases of the evening peaks of activity under LD conditions were correspondingly earlier than normal for the short-period mutants and later than normal for those with long circadian cycle durations. The morning peaks, however, moved (in comparison to the normal phase position) minimally under the influence of a given per variant.

CC ENTOMOLOGY
ST Author Keywords: L[redacted]OMOTOR ACTIVITY; PER-SHORT MUTA[redacted]; PER-LONG MUTANTS; PER-TRANSGENICS; C[redacted]CK MUTANT; BLIND NORPA MUTANT; [redacted]ASE ANALYSIS

35 ANSWER 1 OF 3 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 1
AN 1996:541008 BIOSIS
DN PREV199699263364
TI Steady-state analysis of somatosensory evoked potentials.
AU Noss, Roger S. (1); Boles, Colby D.; Yingling, Charles D.
CS (1) Dep. Anesthesia, Sch. Med., Univ. California, San Francisco, CA 94143-0648 USA
SO Electroencephalography and Clinical Neurophysiology, (1996) Vol. 100, No. 5, pp. 453-461.
ISSN: 0013-4694.
DT Article
LA English
AB We report the development of a new method for frequency domain analysis of steady-state somatosensory evoked potentials (SEPs) to amplitude-modulated electrical stimulation, which can be recorded in significantly less time than traditional SEPs. Resampling techniques were used to compare the steady-state SEP to traditional SEP recordings, which are based on **signal averaging** in the time domain of cortical responses to repetitive transient stimulation and take 1-2 min or more to obtain a satisfactory signal/noise ratio. Median nerves of 3 subjects were stimulated continuously with electrical **alternating current** at several modulation frequencies from 7 to 41 Hz. Amplitude modulation was used to concentrate the power in higher frequencies, away from the modulation frequency, to reduce the amount of stimulus artifact recorded. Data were tested for signal detectability in the frequency domain using the T-circ-2 statistic. A reliable steady-state response can be recorded from scalp electrodes overlying somatosensory cortex in only a few seconds. In contrast, no signal was statistically discriminable from noise in the transient SEP from as much as 20 s of data. This dramatic time savings accompanying steady-state somatosensory stimulation may prove useful for monitoring in the operating room or intensive care unit.
CC Biophysics - General Biophysical Techniques *10504
Nervous System - General; Methods *20501
Nervous System - Physiology and Biochemistry *20504
BC Hominidae *86215
IT Major Concepts
Methods and Techniques; Nervous System (Neural Coordination)
IT Miscellaneous Descriptors
ANALYTICAL METHOD; NERVOUS SYSTEM; NEW METHOD; SIGNAL DETECTABILITY; SOMATOSENSORY EVOKED POTENTIAL; STEADY-STATE ANALYSIS
ORGN Super Taxa
Hominidae: Primates, Mammalia, Vertebrata, Chordata, Animalia
ORGN Organism Name
human (Hominidae)
ORGN Organism Superterms
animals; chordates; humans; mammals; primates; vertebrates

L35 ANSWER 2 OF 3 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 2
AN 1991:384339 BIOSIS
DN BA92:61654
TI PITUITARY MICROCIRCULATION PHYSIOLOGICAL ASPECTS AND CLINICAL IMPLICATIONS
A LASER-DOPPLER FLOW STUDY DURING TRANSSPHENOIDAL ADENOMECTOMY.
AU STEINMEIER R; FAHLBUSCH K; POWERS A D; DOETTERL A; BUCHFELDER M

CS NEUROCHIRURGISCHE KLINK DER UNIV. ERLANGEN-NUERNBERG, SCHWABACHANLAGE 6 KOPFKLINIKUM , 852[redacted]ERLANGEN, GERMANY.
SO NEUROSURGERY (BALT[redacted]ORE), (1991) 29 (1), 47-54.
CODEN: NRSRDY.
FS BA; OLD
LA English
AB The anterior and posterior putuitary lobes (AL and PL, respectively) are assumed to differ in the type of vacular supply and structure of their microvascular networks. Animal experiments have shown that the pituitary microvascular flow differs between the two lobes, being extremely high in the PL and low in the AL. For technical reasons, it has hitherto not been possible to study pituitary microflow in humans. Laser-Doppler flowmetry (LDF) is now a well-established method for real-time monitoring of microcirculation, applicable also in humans. In a prospective clinical study, the microflow in the AL and PL was measured during transsphenoidal microsurgery in 52 patients with adenomas of different size, growth characteristics, and endocrinological activity. The mean microflow in the PL (177.7 .+-. 12.6 [flux]) was found to be about six times higher than that in AL (27.4 .+-. 2.7 [flux]). No difference in the laser-Doppler fractional volume of the lobes could be detected (0.73 .+-. 0.06 [ ] vs. 0.77 .+-. 0.07 [ ], where [ ] designates the ratio of the **alternating current** output to the direct current output signals). Microflow within the pituitary lobes was influenced neither by the histological type nor the size of the adenoma. Additionally, LDF **signal-averaging** triggered by the electrocardiogram allowed detection of different characteristic pulsatile microvascular flow
patterns in the AL and PL. Our findings provide strong physiological support for the idea that the angioarchitecture of the pituitary lobes differs. With this method, the AL and PL can be identified objectively during surgery. LDF might provide useful information concerning intraoperative surgical approach.
CC Radiation - Radiation and Isotope Techniques *06504
Biophysics - General Biophysical Techniques *10504
Anatomy and Histology, General and Comparative - Surgery *11105
Anatomy and Histology, General and Comparative - Radiologic Anatomy *11106
Anatomy and Histology, General and Comparative - Microscopic and Ultramicroscopic Anatomy 11108
Cardiovascular System - Physiology and Biochemistry *14504
Blood, Blood-Forming Organs and Body Fluids - Blood and Lymph Studies *15002
Endocrine System - Pituitary *17014
Neoplasms and Neoplastic Agents - Pathology; Clinical Aspects; Systemic Effects *24004
Neoplasms and Neoplastic Agents - Therapeutic Agents; Therapy *24008
BC Hominidae 86215
IT Miscellaneous Descriptors
HUMAN VASCULAR SUPPLY ANGIOARCHITECTURE

L35 ANSWER 3 OF 3 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.
AN 85095295 EMBASE
DN 1985095295
TI Highly sensitive microcomputer-controlled ac magnetometer with a phase locked data acquisition system.
AU Martin W.E.; Wieser J.
CS Sektion Physik, University of Munich, Munich, Germany
SO Journal of Physics E: Scientific Instruments, (1985) 18/4 (342-349).
CODEN: JPSIAE
CY United Kingdom
DT Journal
FS 027 Biophysics, Bioengineering and Medical Instrumentation
LA English
AB A highly sensitive microcomputer-controlled magnetometer for AC measurements in applied fields of up to 3 x 105 A m-1 is described. The

'AC magnetometer' (operating frequency 50 Hz nominally) is based on a mains-powered sole[illegible]id, and a high resolution **signa[illegible] averaging** system c[illegible]able of analysing extremely sma[illegible] signals down to the order of electronic noise (about 1 .mu.V). The high density of data points allowed by the system demands a personal computer acting as control unit for data acquisition (based on linear summation averaging) and data handling. To profit by the sensitivity and resolution capacity given by **signal averaging** methods and to guarantee precise operation of the mains-supplied AC magnetometer, the data acquisition process must be exactly synchronised to power line frequency. In order to meet this basic requirement in spite of random line frequency fluctuations up to .+-.2.per thousand., a line locked oscillator circuit acting as averager system clock has been developed. The circuit is described here in detail for the first time. The AC magnetometer was employed to record the magnetisation curves, M against H, of ferromagnetic samples having small magnetically effective cross sections, and to determine their AC magnetic properties (saturation magnetisation, remanence, coercivity, susceptibility) in the temperature range down to 4.2 K. The performance of the system is demonstrated here by some tests and by presenting results of magnetic measurements showing e.g. the interesting magnetic behaviour of highly concentrated metal-hydrogen systems with the ferromagnetic component nickel (here with magnetic cross sections down to about 5 x 10-5 mm2).

CT Medical Descriptors:
***alternating current**
*data analysis
*magnetometer
*microcomputer
computer analysis

36 ANSWER 1 OF 1 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.
AN 1999199911 EMBASE
TI Some design concepts for electrical impedance measurement.
AU Goovaerts H.G.; Faes Th.J.C.; Raaijmakers E.; Heethaar R.M.
CS H.G. Goovaerts, Dept. Clinical Physics Informatics, Inst. Cardiovascular Research ICarVU, Univ. Hospital Vrije Universiteit, 1007 MB Amsterdam, Netherlands
SO Annals of the New York Academy of Sciences, (1999) 873/- (388-395).
Refs: 7
ISSN: 0077-8923 CODEN: ANYAA
CY United States
DT Journal; Conference Article
FS 014 Radiology
027 Biophysics, Bioengineering and Medical Instrumentation
LA English
SL English
AB Design concepts for the implementation of two basic functions for measurement of electrical impedance are presented: current injection and voltage measurement. At relatively high frequencies, the application of an **alternating current** through the body or a body segment results in electromagnetic stray fields that reduce the amount of current actually injected into the tissue under study. It is shown that electrical isolation and small dimensions of the isolated section are indispensable in order to substantially reduce these stray currents. The paper describes a new wideband current source configuration driven by direct digital sine wave synthesis (DDS) presenting very low stray currents due to a symmetrical layout. Two implementations of the actual current source circuit are presented: (1) a voltage-controlled system and (2) a current conveyor-based circuit. A wideband input amplifier with transformer coupling is described. The current source, amplifier, and (in case of tomography) multiplexer are also situated on an electrically isolated front end. The presented concepts are applied in a new electrical impedance tomograph (EIT) presently under construction in our department.
CT Medical Descriptors:
*impedance
*diagnostic imaging
alternating current
electric potential
measurement
electromagnetic field
direct current
digital filtering
amplifier
tomography
human
confe

L41 ANSWER 1 OF 10 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 1
AN 1996:554604 CAPLUS
DN 125:259590
TI Surface charge density measurements with a controlled growth mercury **electrode**
AU O'Dea, John J.; Ciszkowska, Malgorzata; Osteryoung, Robert A.
CS Dep. Chem., North Carolina State Univ., Raleigh, NC, 27695, USA
SO Electroanalysis (1996), 8(8-9), 742-747
CODEN: ELANEU; ISSN: 1040-0397
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 66
AB The surface charge d. of the Hg electrolyte interface is estd. by using chronocoulometry at a controlled-growth Hg **electrode**. After initial formation and equilibration, the Hg drop is expanded by further addn. of Hg. Direct measurement of the charge, required as new area is formed, is used to est. the surface charge d. The Hg drop is modeled as a step-wise expanding sphere. The capillary noise continuously produced by stationary drops under potential control was investigated and characterized. **Spectral anal.** of the noise reveals that the **electrode** is particularly sensitive to vibrations near the resonant frequency of the suspended drop. Ambient vibrations in the lab. environment produce **alternating currents** at the **electrode** which vanish at the point of zero charge and so mark its position.
ST surface charge density mercury **electrode**
IT **Electrodes**
(surface charge d. detn. of Hg/electrolyte interface by chronocoulometry at a controlled-growth Hg **electrode**)
IT Electric charge
(surface, d.; detn. of Hg/electrolyte interface by chronocoulometry at a controlled-growth Hg **electrode**)
IT 7601-90-3, Perchloric acid, uses
RL: NUU (Nonbiological use, unclassified); PRP (Properties); USES (Uses)
(detn. of Hg/HClO4 electrolyte interface by chronocoulometry at controlled-growth Hg **electrode**)
IT 7439-97-6, Mercury, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(surface charge d. detn. of Hg/electrolyte interface by chronocoulometry at a controlled-growth Hg **electrode**)

L41 ANSWER 2 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1991:16654 CAPLUS
DN 114:16654
TI **Spectral analysis** using a high-voltage a.c. arc. Stability of the constant calibration diagram
AU Skuratova, T. A.; Trapitsyn, N. F.
CS Kirg. Gos. Univ., Frunze, USSR
SO Zh. Prikl. Spektrosk. (1990), 53(4), 662-3
CODEN: ZPSBAX; ISSN: 0514-7506
DT Journal
LA Russian
CC 79-1 (Inorganic Analytical Chemistry)
AB A high-voltage a.c. arc source was used in the anal. of brass LS-59 for impurities with the utilization of a const. calibration diagram. The method of carrying out the analyses was developed in an earlier work. The

const. calibration diagram was constructed with std. samples contg. Si, Sn, Fe, Pb, Al, and Ni, which were subjected to combustion in the arc at a current of 3 A and source voltage of 1900 V, with a distance between the **electrodes** of 3 mm. The std. sample served as the lower **electrode**, while the upper **electrode** was C. With this method, it is possible to keep position of this diagram const. over a long time. In 16 yr of continuous operation of the generator, no displacement of the calibration diagram was obsd. This source for the excitation of spectra can be used idefinitely for the anal. of metals and alloys.

ST high voltage **alternating current** arc analysis; metal analysis **alternating current** arc; alloy analysis **alternating current** arc; const calibration diagram stability analysis

IT Alloys, analysis
Metals, analysis
RL: ANT (Analyte); ANST (Analytical study)
(anal. of, stability of const. calibration diagram using high-voltage a.c. arc source for)

IT Spectrochemical analysis
(at. emission, of alloys and metals, stability of const. calibration diagram using high-voltage a.c. arc source for)

L41 ANSWER 3 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1983:532822 CAPLUS
DN 99:132822
TI Characteristics of an **alternating-current** arc and high-frequency spark discharges used in the **spectral analysis** of metals and alloys in air and argon
AU Eroshenko, L. E.; Dem'yanchuk, A. S.
CS USSR
SO Zh. Prikl. Spektrosk. (1983), 39(1), 15-21
CODEN: ZPSBAX; ISSN: 0514-7506
DT Journal
LA Russian
CC 79-2 (Inorganic Analytical Chemistry)
AB Discharge generated with conical Cu counter **electrodes** in anal. of steel and cast iron stds. were studied by high-speed filming and also by metallog. and recording profiles of the analyzed samples. Suppression of matrix effects with a.c. arc sources in Ar and high-frequency spark sources in air and Ar can be explained by random movement of the discharge on the sample surface.

ST arc discharge metal analysis spectrog; spark discharge metal analysis spectrog; metal analysis spectrog discharge source; alloy analysis spectrog discharge source; air atm spectrog discharge; argon atm spectrog discharge

IT Alloys, analysis
Metals, analysis
RL: ANT (Analyte); ANST (Analytical study)
(anal. of, matrix effect suppression with arc and spark sources in spectrog.)

IT Electric arc
Electric spark
(in spectrog. anal. of alloys and metals, in air and argon, matrix effect suppression with)

IT Spectrochemical analysis
(emission, of alloys and metals, matrix effect suppression with arc and spark sources in)

IT 11097-15-7, analysis 12597-69-2, analysis
RL: ANT (Analyte); ANST (Analytical study)
(anal. of, matrix effect suppression with arc and spark sources in spectrog.)

L41 ANSWER 4 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1984:603338 CAPLUS
DN 101:203338
TI Vaporization of basic components of a powdered sample from an **alternating-current** carbon arc crater
AU Yankovskaya, T. A.
CS USSR
SO Primen. Spektr. Anal. Nar. Khoz. Nauchn. Issled., Mater. Resp. Semin. Spektr. Anal. (1982), Meeting Date 1981, 72-8. Editor(s): Petukh, M. L.; Yankovskii, A.. Publisher: Akad. Nauk BSSR, Inst. Fiz., Minsk, USSR. CODEN: 52GVA2
DT Conference
LA Russian
CC 79-1 (Inorganic Analytical Chemistry)
AB The erosion of arc **electrodes** and the evapn. of sample components in emission spectrog. anal. of powders with 9 and 18-A sources were studied as functions of time by using **electrodes** of different dimensions for anal. of model mixts. of synthetic silicate rock stds. of different wt.
ST sample evapn arc **spectral analysis**; powder evapn arc **spectral analysis**; carbon arc powd sample evapn; silicate rock analysis emission spectrometry
IT Powders
(anal. of, by emission spectrometry, vaporization of basic components in a.c. arcs for)
IT Erosion
(of arc **electrodes** in spectrochem. anal.)
IT Evaporation
(of basic components of powd. samples from a.c. arcs for **spectral anal**.)
IT Electric lamps
(arc, with carbon **electrodes**, for emission **spectral anal**., erosion and vaporization studies in relation to)
IT Spectrochemical analysis
Spectrochemical analysis
(emission, of powd. samples, vaporization in a.c. arc sources in relation to)
IT Rocks
RL: ANT (Analyte); ANST (Analytical study)
(silicate, anal. of, by emission spectrometry, vaporization of basic components in a.c. arcs for)
IT 7440-44-0, uses and miscellaneous
RL: USES (Uses)
(arc **electrodes**, in emission **spectral anal**., vaporization of basic components of powd. samples from a.c.)

L41 ANSWER 5 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1978:452689 CAPLUS
DN 89:52689
TI Study of the relation of effective parameters of an **alternating-current** arc plasma to the composition of coal graphite materials
AU Zhilova, A. N.; Akimov, V. A.; Egorova, V. A.
CS USSR
SO Tr. Mosk. Khim.-Tekhnol. Inst. (1976), 91, 129-30
CODEN: TMKIAT; ISSN: 0371-9723
DT Journal
LA Russian
CC 79-1 (Inorganic Analytical Chemistry)
Section cross-reference(s): 76
AB The effective parameters of an 8-A a.c. arc plasma between graphite **electrodes** for emission **spectral anal**. were calcd. as functions of the analyte concns. in carbonaceous samples, such as coke, glassy C, graphite, and pyrolytic graphite. The effective temp. (Te) was calcd. by using Zn as a thermometric element, the presence of

which was maintained in the plasma by using a 2-mm wide and 15-mm deep **electrode** crater. [redacted]he electron concn. (ne) was cal[redacted] by using the spectral line [redacted]tensities of Mg. Both Te and n[redacted] decrease symbatically with an increase in analyte concn. from 3 .times. 10-3 to 1 .times. 10-1%. The type of coke used did not affect ne and Te at analyte concns. .ltoreq.2 .times. 10-1%.

ST carbon analysis emission spectrometry; coke analysis emission spectrometry; graphite analysis emission spectrometry; temp spectral arc plasma; electron concn spectral arc plasma; arc plasma temp electron concn

IT Coke
RL: ANT (Analyte); ANST (Analytical study)
(anal. of, by emission spectrometry, electron concn. and plasma temp. in a.c. arc for)

IT Plasma
(electron concn. and temp. of arc, analyte concn. in spectrochem. anal. of carbonaceous material in relation to)

IT Spectrochemical analysis
(emission, of carbonaceous materials, electron concn. and plasma temp. in a.c. arc for)

IT 7440-44-0, analysis
RL: ANST (Analytical study)
(anal. of glassy, by emission spectrometry, electron concn. and plasma temp. in a.c. arc for)

IT 7782-42-5, analysis
RL: ANT (Analyte); ANST (Analytical study)
(anal. of, by emission spectrometry, electron concn. and plasma temp. in a.c. arc for)

L41 ANSWER 6 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1978:452679 CAPLUS
DN 89:52679
TI Axial-time distribution of the basic plasma parameters in an **alternating current** arc. II
AU Kapitonov, A. N.
CS USSR
SO Nek. Vopr. Fiz. (1975), 9-14. Editor(s): Solov'ev, G. N. Publisher: Yakutsk. Gos. Univ., Yakutsk, USSR.
CODEN: 37OOAY
DT Conference
LA Russian
CC 79-1 (Inorganic Analytical Chemistry)
AB The axial and time distribution of the electron concn. (Ne) and temp. (T) in the plasma of an arc for emission **spectral anal.** is discussed. The excitation conditions characterized by Ne and T depend on the phase of the arc discharge, **electrode** polarity, and the position in the arc gap. Stable excitation conditions were obsd. at 0.8-1.7 mm above the lower **electrode**.
ST arc plasma emission **spectral analysis**; temp distribution arc plasma; electron distribution arc plasma
IT Plasma
(electron concn. and temp. in a.c. arc, axial-time distribution of)
IT Spectrochemical analysis
(emission, excitation condition in a.c. arc for)

L41 ANSWER 7 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1978:452678 CAPLUS
DN 89:52678
TI Axial-time distribution of the plasma parameters in an **alternating current** arc. I
AU Alekseev, M. A.; Kapitonov, A. N.
CS USSR

SO Nek. Vopr. Fiz. (1975), 3-8. Editor(s): Solov'ev, G. N. Publisher: Yakutsk. Gos. Univ., Yakutsk, USSR.
CODEN: 37OOAY
DT Conference
LA Russian
CC 79-1 (Inorganic Analytical Chemistry)
AB The axial and time distribution of the electron concn. (Ne) and temp. (T) in the plasma of an a.c. arc for emission **spectral anal**. was explained by the effect of the elec. field upon the transport of metal atoms in the excitation zone. The distribution of Ne and T is a function of the polarity of the graphite **electrode** contg. the sample. The excitation conditions during the anal. of samples contg. easily ionizable components, such as Na or Ca, can be improved by placing the easily ionizable materials on both **electrodes**.
ST arc plasma emission **spectral analysis**; temp distribution arc plasma; electron distribution arc plasma
IT Plasma
(electron concn. and temp. in a.c. arc, transport of metals in elec. field in relation to)
IT Electric field, chemical and physical effects
(alternating, on transport of metals in arc plasma, axial and time distribution of plasma parameters in relation to)
IT Spectrochemical analysis
(emission, for easily ionizable components, a.c. arc plasma stabilization by placing materials on both **electrodes** in)

L41 ANSWER 8 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1972:549675 CAPLUS
DN 77:149675
TI **Spectral analysis** of plant material
AU Glinski, Jan; Nowicki, Ryszard
CS Inst. Agrophys., Pol. Acad. Sci., Lublin, Pol.
SO Pol. J. Soil Sci. (1972), 4(2), 113-18
CODEN: PJSOBN
DT Journal
LA English
CC 11-1 (Plant Biochemistry)
Section cross-reference(s): 9
AB Thirteen trace elements (B, Ba, Co, Cu, Cr, F, Mn, Mo, Ni, Pb, Sr, V, and Zn) in plant ash can be detd. by emission **spectral anal**. with a spectrograph of medium dispersion Q-24 on sample excitation from shallo craters of graphite **electrodes** in an interrupted arc of **alternating current**, with synthetic stds. Six major elements (Al, K, Mg, Na, P, and Si) can be detd. simultaneously.
ST trace element detn plant; mineral detn plant
IT Trace elements
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, in plant tissue)
IT Plant analysis
(for trace elements)

L41 ANSWER 9 OF 10 CAPLUS COPYRIGHT 2000 ACS
AN 1969:117717 CAPLUS
DN 70:117717
TI Spectrographic study in the ceramic industry
AU Bolgar, Gabor
CS Magnezitipari Muevek, Budapest, Hung.
SO Kohasz. Lapok (1967), 100(5), 217-8
From: CZ 1969 (3), Abstr. No. 1983
CODEN: KOLAAR
DT Journal
LA Hungarian
CC 57 (Ceramics)
AB The powd. sample is mixed in an agate mortar with Ba(NO3)2 and spectrally pure graphite powder. The absorption is measured with a graphite

electrode and **alternating current** arc excitation. The lines Mg 2781.42 A. (for Si, Mn and Fe) and Ba 3071.59 A. (for Al and Ca) are used as standards for comparison. The process gives an acceptable value at high-Mg content.

ST **spectral anal** ceramics

IT Ceramic materials
(anal. of, spectrochem.)

L41 ANSWER 10 OF 10 CAPLUS COPYRIGHT 2000 ACS

AN 1967:34491 CAPLUS

DN 66:34491

TI Effect of **electrode** polarity on the current and radiation of an **alternating current** arc for **spectral analysis**

AU Brainin, E. I.; Pyasetskaya, L. I.

SO Zh. Prikl. Spektrosk. (1966), 5(3), 399-402
CODEN: ZPSBAX

DT Journal

LA Russian

CC 79 (Inorganic Analytical Chemistry)

AB The relation between spectral line intensities and the current of an a.-c. arc during consecutive half cycles was studied exptl. by using the ISP-30 spectrograph with **electrodes** of pure C and Ag, and Ag **electrodes** contg. various amts. of CdO, Al2O3, ZnO, Fe2O3, CuO, Na2CO3, Cu, Ni, and W. The current difference (.DELTA.i) and the log of spectral line intensities were detd. as a function of temp. and the admixt. concns. for 20 **electrodes** during the anode-cathode alternation. The difference in .DELTA.i during the alternation is attributed to the difference in the emission of electrons and ions from the **electrodes** into the plasma. The emission of electrons increased with cathode temp. When both **electrodes** are of the same material, then the difference in the emission is detd. by the **electrode** surface temp. In most cases the spectra intensities increased with increasing current.

ST **ELECTRODES** POLARITY SPECTROSCOPY; POLARITY **ELECTRODES** SPECTROSCOPY; SPECTROSCOPY **ELECTRODES** POLARITY

IT Analysis
(spectrochem., **electrode** polarity effect on current and radiation of a.c. arc in)